

# **Seagate Pretrial Exhibit G REDACTED**

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**IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

LAMBETH MAGNETIC  
STRUCTURES,  
LLC,

Plaintiff,

V.

SEAGATE TECHNOLOGY (US)  
HOLDINGS, INC. and SEAGATE  
TECHNOLOGY LLC,

Defendants.

Case No.: 2:16-cv-00538

**REBUTTAL EXPERT REPORT  
OF  
JOHN C. JAROSZ**

July 16, 2018

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**I. INTRODUCTION**

**A. Assignment**

1. I, John C. Jarosz, submit this rebuttal expert report on behalf of Seagate Technology (US) Holdings, Inc. and Seagate Technology LLC (collectively, “Seagate”) in the above-captioned case. I have been retained by Seagate to provide expert analysis and testimony, if necessary, related to the damages that may have been sustained by Lambeth Magnetic Structures LLC (“LMS”) due to Seagate’s alleged infringement of U.S. Patent No. 7,128,988 (the “’988 Patent” or “patent-in-suit”).<sup>1</sup> As part of my assignment, I have been asked to provide my opinions regarding the analyses and conclusions in the April 30, 2018 Expert Report of Ms. Catherine M. Lawton (“Lawton Report”), which was submitted on behalf of Lambeth.
2. I hold and express no opinions on liability in this matter. For the purposes of my analysis, I have assumed that the ‘988 Patent will be found valid, enforceable, and infringed by Seagate. I understand that Seagate contends that the ‘988 Patent is neither valid nor infringed.
3. This report summarizes the opinions that I have formed to date. I may modify or supplement my opinions, if necessary and allowed, based on the review and analysis of information provided to me subsequent to the filing of this report.

**B. Summary of Conclusions**

4. Ms. Lawton has concluded that, assuming liability is proven, the appropriate remedy here is a running royalty payment of \$0.30 per head gimbal assembly (“HGA”), which results

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<sup>1</sup> Complaint and Demand for Trial by Jury, April 29, 2016 (“Complaint”), at 1.

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in reasonable royalty damages in the range of \$315.1 million to \$1.382 billion.<sup>2</sup> Ms. Lawton's analysis and conclusions are flawed for several reasons. Among other things, she inappropriately dismissed available and relevant evidence from previous licenses and valuations of the '988 Patent, and mischaracterized or misinterpreted many critical terms of the agreements on which she did rely. In fact, had she accurately evaluated the Censtor Corp.-Hitachi license that she described as the "starting point valuation metric"<sup>3</sup> and is at the core of her analysis, she would have arrived at a lump-sum payment here of \$4,950,000.<sup>4</sup>

5. As a result of her flawed analysis, her estimated royalty of \$0.30 for the '988 Patent – which is directed to a technology allegedly practiced in the write pole, a subcomponent of the write head, which is a subcomponent of an HGA, which is but one of many subassemblies of a hard disk drive – would constitute roughly 90 percent<sup>5</sup> of the total cost of the smallest salable patent practicing unit (the wafer level slider, which contains, among other things, the read and write heads, a heater, and an air bearing surface<sup>6</sup>). And her resulting damages estimate is many multiples of actual amounts that have been paid for the same or similar technology in the real-world marketplace. Ms. Lawton has overstated the economic contribution and value of the '988 Patent.
6. Based upon my review and analysis of the evidence that I have received to date, reasonable royalty damages that should be paid to LMS by Seagate for the alleged infringement of the

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<sup>2</sup> Lawton Report, Seagate Schedule A.1. Ms. Lawton provided a number of scenarios, labeled Scenario 1 – 3 for her damages range. She also included a separate category labeled "Worldwide HGAs," and this category results in the highest end of the damages range, *i.e.*, \$1.382 billion. It is not clear, however, whether Ms. Lawton is offering an opinion that Lambeth is entitled to damages based on "Worldwide HGAs."

<sup>3</sup> Lawton Report, ¶ 1004; LAMBETH-000254815-900, at LAMBETH-000254821.

<sup>4</sup> Tab 15.

<sup>5</sup> Section IV.C.4.

<sup>6</sup> Fullerton Report, ¶151.

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'988 Patent range from \$3 million to \$8 million, and are certainly no greater than \$10 million.<sup>7</sup> And the \$3 million may, in fact, be too high in light of the terms and significance of the Jülich license. My conclusions are based upon, among other things,

- Seagate, LMS, and industry license, valuation, and sale agreements;
- the benefits associated with the patented invention;
- design-around alternatives, and
- consideration of the *Georgia-Pacific* factors.

**C. Qualifications**

7. I am a Managing Principal of Analysis Group, Inc. ("Analysis Group") and Director of the firm's Washington, D.C. office. Analysis Group is an economic, financial, health care, and strategy consulting firm with offices in Beijing, China; Boston, MA; Brussels, Belgium; Chicago, IL; Dallas, TX; Denver, CO; London, England; Los Angeles, CA; Menlo Park, CA; Montreal, Quebec; New York, NY; Paris, France; San Francisco, CA; and Washington, DC. We provide research and analysis in a variety of business, litigation, and regulatory settings, and have particular expertise in intellectual property ("IP") matters, having been engaged in numerous matters involving patents, trademarks, copyrights, trade secrets, and unfair competition.
8. I am an economist whose specialty is IP valuation and monetary relief (including damages) assessment. I have been involved in more than 350 such engagements, spanning a broad range of industries. My resume is attached as Tab 1. It describes my testimony (either in deposition or at trial) and my publications.

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<sup>7</sup> Tab 13.



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**D. Evidence Considered**

9. In preparing this report, I have considered information from a variety of sources, each of which is a type that is reasonably relied upon by experts in my field. The documents that I considered are identified in Tab 2. In addition, I and people working with me have spoken with Matthew Hadley, Senior Staff Engineer at Seagate; Dan Floeder, Director Materials CMT at Seagate; and Dr. Eric Fullerton, Seagate's technical expert.
10. I also have relied upon my professional judgment and expertise, gathered in many years of estimating damages and valuing technology in IP contexts.

**E. Compensation**

11. My firm has billed Seagate on a time-and-materials basis for my work and that of my colleagues. My hourly billing rate for the time spent consulting and calculating damages, which includes my study of pertinent issues and materials, and any testimony I may give, is \$780. I also have directed the efforts of other staff members of Analysis Group, whose hourly billing rates range from \$300 to \$675. My compensation is not, in any way, dependent on the outcome of this proceeding or on the substance of my opinion.

**II. BACKGROUND**

**A. Parties-in-Suit**

**1. LMS**

12. LMS is a limited liability company that was organized under the laws of Pennsylvania in 2014 and is headquartered in Pittsburgh, PA.<sup>8</sup> LMS was formed to license patents invented by Dr. David N. Lambeth, and purports to be the current owner, by assignment, of the '988

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<sup>8</sup> Complaint, at 1; Deposition of David N. Lambeth, February 26, 2018, ("Lambeth 02/26 Deposition"), at 83.

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Patent.<sup>9</sup>

13. Dr. Lambeth is the controlling member of LMS.<sup>10</sup> Dr. Lambeth currently owns 70 percent of the company. His daughter and son each owns 15 percent of the company.<sup>11</sup> To date, LMS has not manufactured or sold any product.<sup>12</sup> LMS does not currently have nor has it ever had any employees.<sup>13</sup>
14. Dr. Lambeth owns another sole proprietorship, Lambeth Systems (“LS”).<sup>14</sup> According to Dr. Lambeth, LMS and LS “operate separately and independently.”<sup>15</sup> Dr. Lambeth described his principal activities at LS as “to provide technical consulting, as well as to privately develop technology, intellectual property, and the protection of intellectual property in fields including new magnetic materials, thin film structures, sensor systems, sensor devices and electronic circuits and systems.”<sup>16</sup> The ‘988 Patent was originally assigned to LS.<sup>17</sup> In 2014, LS assigned its rights in the ‘988 Patent and its foreign equivalents to LMS.<sup>18</sup>

## **2. Seagate**

15. Seagate Technology (US) Holdings, Inc. is the parent company of Seagate Technology LLC.<sup>19</sup> Organized under the laws of Delaware, Seagate Technology LLC is a limited

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<sup>9</sup> Complaint, at 2.

<sup>10</sup> Lambeth 02/26 Deposition, at 56.

<sup>11</sup> Lambeth 02/26 Deposition, at 56.

<sup>12</sup> Lambeth 02/26 Deposition, at 44.

<sup>13</sup> Lambeth 02/26 Deposition, at 57.

<sup>14</sup> Lambeth 02/26 Deposition, at 7, 20.

<sup>15</sup> Lambeth 02/26 Deposition, at 81.

<sup>16</sup> LAMBETH-000139375.

<sup>17</sup> LAMBETH-000139391 and Lambeth 02/26 Deposition, at 21. In addition to the ‘988 Patent, the U.S. patent application titled “Uniform Amorphous Oxide Seedlayer Magnetic Media Structures and Methods of Making” was filed on July 29, 2002 and assigned to LS, with Dr. Lambeth and Kenzo Hanawa listed as inventors.

<sup>18</sup> Lambeth 02/26 Deposition, at 81.

<sup>19</sup> Complaint, at 1.

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liability company headquartered in Cupertino, CA.<sup>20</sup> Seagate Technology (US) Holdings, Inc. is a wholly-owned subsidiary of Seagate Technology PLC.<sup>21</sup> Seagate Technology PLC is a public company organized under the laws of Ireland with its principal executive office in Dublin, Ireland. Seagate Technology PLC is the parent company of over 90 entities around the world, including Seagate Technology (US) Holdings, Inc. and Seagate Technology LLC.<sup>22</sup> Unless otherwise specified, I refer to these entities collectively as “Seagate.”

16. Seagate is a leading provider of data storage technology and solutions whose principal products are hard disk drives, commonly referred to as hard drives or HDDs. In addition to HDDs, Seagate also produces a variety of other data storage products, including solid state drives (“SSDs”) and their related controllers, solid state hybrid drives (“SSHDS”) and storage subsystems.<sup>23</sup>
17. Seagate was created in 1978 under the name of Shugart Technology.<sup>24</sup> In 1979, it officially changed its name to Seagate Technology.<sup>25</sup> In 1980, Seagate introduced the first 5.25-inch HDD, which enabled HDDs to be inserted into personal computers (“PCs”) in volume.<sup>26</sup> Seagate became a public company in 1981 and, by the end of 1982, had opened its first overseas location in Singapore, and reported that it had captured half the market for small HDDs.<sup>27</sup>

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<sup>20</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2017, at Exhibit 21.1.

<sup>21</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2017, at Exhibit 21.1; Deposition of Patrick Shay, February 15, 2018 (“Shay Deposition”), at 47.

<sup>22</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2017, at Exhibit 21.1.

<sup>23</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2017, at 2.

<sup>24</sup> <https://www.seagate.com/about-seagate/seagate-history/> (accessed June 15, 2018).

<sup>25</sup> <https://www.seagate.com/about-seagate/seagate-history/> (accessed June 15, 2018).

<sup>26</sup> <https://www.seagate.com/about-seagate/seagate-history/> (accessed June 15, 2018).

<sup>27</sup> <https://www.seagate.com/about-seagate/seagate-history/> (accessed June 15, 2018).

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18. In 1990, Seagate released its first 2.5-inch HDD.<sup>28</sup> In November 2000, Seagate became a private company but, in December 2002, became a publicly-traded company again.<sup>29</sup> In 2004, Seagate introduced Savvio, the first 2.5-inch enterprise HDDs in the industry.<sup>30</sup> Seagate introduced its first solid state drive in 2009.<sup>31</sup> In 2014, Seagate launched its Cloud Systems and Solutions business segment.<sup>32</sup> In fiscal year 2017,<sup>33</sup> Seagate Technology PLC reported revenues of \$10.8 billion and income from operations of \$1.1 billion and net income of \$772 million.<sup>34</sup>
19. Revenues from HDD sales historically have represented the vast majority of Seagate's total revenues. HDDs accounted for more than 90 percent of Seagate's total revenue for each of the last six fiscal years, dating back to fiscal year 2012.<sup>35</sup> In fiscal year 2012, HDDs accounted for almost 99 percent of Seagate's global revenue.<sup>36</sup>
20. As discussed below, the HDD industry has become extremely competitive. As a result, Seagate's strategy has been to focus on research and development ("R&D") in an effort to maintain or reduce production costs, and innovate towards the next generation of HDD technologies. According to Seagate, it "[has] been pursuing, and will continue to pursue, a number of technologies to increase areal densities across the entire range of [Seagate's] products for expanding disk drive capacities and reducing the number disks and heads per

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<sup>28</sup> <https://www.seagate.com/about-seagate/seagate-history/> (accessed June 15, 2018).

<sup>29</sup> <https://www.seagate.com/about-seagate/seagate-history/> (accessed June 15, 2018).

<sup>30</sup> <https://www.seagate.com/about-seagate/seagate-history/> (accessed June 15, 2018).

<sup>31</sup> <https://www.seagate.com/about-seagate/seagate-history/> (accessed June 15, 2018).

<sup>32</sup> <https://www.seagate.com/about-seagate/seagate-history/> (accessed June 15, 2018).

<sup>33</sup> Seagate's fiscal years end at the end of June of the corresponding calendar years. Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2017, at 1.

<sup>34</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2017, at 32.

<sup>35</sup> Tab 3.

<sup>36</sup> Tab 3.

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drive to further reduce product costs.”<sup>37</sup>

21. Seagate created Seagate Research in 1998 in order to develop and prototype HDD technology.<sup>38</sup> Expenditures on product development accounted for 6.7 percent to 11.4 percent of Seagate’s total revenues between fiscal years 2006 and 2017, and have consistently exceeded \$1 billion annually since 2012.<sup>39</sup>
22. Seagate’s product development efforts and innovation have contributed to its leadership position in the HDD industry. Seagate introduced the first 5.25-inch form factor hard disk in 1980; in 1992, Seagate introduced the first 2.5-inch shock-sensing hard drive; in 2006, Seagate released the first 2.5-inch notebook hard drive that used perpendicular magnetic recording (“PMR”) technology.<sup>40</sup>
23. Seagate also has been at the forefront of increasing revolutions-per-minute (“rpm”) to enhance the speed at which HDDs can access data.<sup>41</sup> In 1992, Seagate was the first supplier of a 7200-rpm hard drive, the 2.1 Gigabyte (“GB”) Barracuda; in 1996, it introduced the first 10,000-rpm hard drive, the Cheetah family; in 2000, Seagate introduced the first 15,000-rpm hard drive, the Cheetah X15.<sup>42</sup>
24. Dating back to at least 2002, Seagate has also been at the forefront of the development of next-generation recording technologies. Seagate demonstrated a PMR areal density of 100 gigabits per square inch in 2002.<sup>43</sup> In the same year, Seagate also successfully

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<sup>37</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2015, at 7.

<sup>38</sup> <https://www.seagate.com/about-seagate/seagate-history/> (accessed June 15, 2018).

<sup>39</sup> Tab 3.

<sup>40</sup> <https://www.pcworld.com/article/127105/article.html> (accessed June 8, 2018).

<sup>41</sup> <https://www.seagate.com/tech-insights/choosing-high-performance-storage-is-not-about-rpm-anymore-master-ti/> (accessed July 10, 2018).

<sup>42</sup> <https://www.pcworld.com/article/127105/article.html> (accessed June 8, 2018).

<sup>43</sup> <https://www.pcworld.com/article/127105/article.html> (accessed June 8, 2018).

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demonstrated Heat-Assisted Magnetic Recording (“HAMR”).<sup>44</sup> HAMR records magnetically, by using laser-thermal assistance, and ultimately aims to increase areal density by more than 100 times over 2002 levels.<sup>45</sup> By 2006, Seagate had increased the storage capacity of HDDs to 750 GB with its Barracuda 7200.10 product, then the largest hard drive in the industry.<sup>46</sup>

25. Seagate’s commitment to innovation repeatedly has been recognized in the industry. Seagate earned a “Best Product Innovation” award in CMP Media’s Annual Report Card awards in 2005.<sup>47</sup> In 2006, Seagate was named Company of the Year by Forbes Magazine.<sup>48</sup> Seagate has been recognized by Clarivate Analytics as one of the top 100 global innovators every year since 2012.<sup>49</sup>
26. Despite its strategic efforts to control product costs, Seagate has not seen a meaningful increase in its profitability. Between fiscal years 2002 and 2017, Seagate’s average gross margin remained relatively constant over time.<sup>50</sup> Seagate’s average gross margin was 24.3 percent between fiscal years 2002 and 2006, and 24.9 percent between fiscal years 2007 and 2017.<sup>51</sup>

## **B. Industry**

27. HDDs store information by digitally encoding data on rapidly rotating disks with magnetic

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<sup>44</sup> <https://www.pcworld.com/article/127105/article.html> (accessed June 8, 2018).

<sup>45</sup> <https://www.pcworld.com/article/127105/article.html> (accessed June 8, 2018).

<sup>46</sup> <https://www.pcworld.com/article/127105/article.html> (accessed June 8, 2018).

<sup>47</sup> <https://www.seagate.com/about-seagate/news/seagate-wins-company-of-the-year-and-best-product-innovation-arc-awards-from-varbusiness-magazine-master-pr/> (accessed July 10, 2018).

<sup>48</sup> <https://www.seagate.com/about-seagate/news/seagate-named-2006-company-of-the-Year-by-forbes-magazine-master-pr/> (accessed July 10, 2018).

<sup>49</sup> Clarivate Analytics, “Top 100 Global Innovators Report 2017,” at 17.

<sup>50</sup> Tab 3.

<sup>51</sup> Tab 3.

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surfaces.<sup>52</sup> Given their high-quality performance and cost advantages, HDDs remain the primary medium of mass data storage for a variety of applications in consumer electronics, ranging from gaming consoles to mobile computing.<sup>53</sup>

### 1. HDD Components and Functions

28. HDDs incorporate many distinct and technologically complex components. Depending on the level of detail, industry coverage of disk drives generally identifies a few to approximately a dozen major components, each of which is comprised of multiple components and technologies.<sup>54</sup>
29. HDDs use spinning disks (platters) to magnetically store information. A disk is generally composed of a lubricant layer, protective layer, media layer, and a substrate of finely machined aluminum or glass with a layer of a thin-film magnetic material.<sup>55</sup> One or more disks are attached to a spindle assembly powered by a motor that rotates the disks at a high constant speed around a hub.<sup>56</sup> Magnetically storing information on an HDD requires a combination of reading and writing data through the read/write heads, which scan the disk as it spins.<sup>57</sup> Read/write heads are mounted on an E-shaped arm assembly and fly extremely close to each disk surface, recording and retrieving data from concentric tracks in the

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<sup>52</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2017, at 2.

<sup>53</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2017, at 2.

<sup>54</sup> See, e.g., [http://hddscan.com/doc/HDD\\_from\\_inside.html](http://hddscan.com/doc/HDD_from_inside.html) (accessed July 10, 2018), <https://social.technet.microsoft.com/wiki/contents/articles/13267.anatomy-of-hard-disk-drives-a-deep-look-into-hard-drives.aspx> (accessed July 10, 2018) <https://www.bhphotovideo.com/explora/computers/tips-and-solutions/anatomy-hard-drive> (accessed July 10, 2018); <https://www.computerworld.com/article/2585698/data-center/anatomy-of-a-hard-disk.html> (accessed July 10, 2018).

<sup>55</sup> See, e.g., <https://general-animagraffs.netdna-ssl.com/wp-content/uploads/platters-spindle-1.png> (accessed July 10, 2018).

<sup>56</sup> A spindle includes parts such as spacer rings, fluid bearing, and caps and screws. <https://general-animagraffs.netdna-ssl.com/wp-content/uploads/platters-spindle-1.png> (accessed July 10, 2018).

<sup>57</sup> The process of storing information involves major components such as an actuator, connections, logic board, disks, and spindle. Other parts involved in reading and writing data include a voice coil, ribbon, arms, and slider. See <https://general-animagraffs.netdna-ssl.com/wp-content/uploads/how-hard-disk-drives-work-1.png> (accessed July 10, 2018).

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magnetic layers of the rotating disks.<sup>58</sup>

30. Seagate has described the process of reading and writing data:

Upon receiving instructions from the drive's electronic circuitry, a head-positioning mechanism, or actuator, guides the heads to the selected track of a disk where the data are recorded or retrieved. Application-specific integrated circuits, or ASICs, and ancillary electronic control chips are collectively mounted on printed circuit boards. ASICs move data to and from the read/write head and the internal controller, or interface, which communicates with the host computer. Disk drive manufacturers typically use one or more of several industry-standard interfaces, such as advanced technology architecture, or ATA, Serial ATA, or SATA, which provides higher data transfer rates than the previous ATA standard, small computer system interface, or SCSI, serial attached SCSI, or SAS, and Fibre Channel.<sup>59</sup>

All components of an HDD are enclosed in a case equipped with circulation and filtering functions, which balance the air pressure in and out of the case and catch debris created or disturbed by disks in the process of reading and writing data.<sup>60</sup>

## 2. Technological Innovations

31. IBM is commonly credited with introducing the first HDD in 1956.<sup>61</sup> This hard drive, shipped with the RAMAC 305 system, is a massive drive in its physical size and contains 50 platters measuring two feet in diameter.<sup>62</sup> It held 5MB of data, and was initially priced at a monthly charge of \$3,200.<sup>63</sup>
32. Since the first commercialization of HDDs in 1956, the industry has been characterized by “rapid technological innovations, significant cyclical trends, and persistent concerns

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<sup>58</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2006, at 5.

<sup>59</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2006, at 5.

<sup>60</sup> <https://general-animagraffs.netdna-ssl.com/wp-content/uploads/case-1.png> (accessed July 10, 2018).

<sup>61</sup> See, e.g., “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 2.

<sup>62</sup> See, e.g., “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 2.

<sup>63</sup> See, e.g., [https://www-03.ibm.com/ibm/history/exhibits/650/650\\_pr2.html](https://www-03.ibm.com/ibm/history/exhibits/650/650_pr2.html) (accessed July 10, 2018), “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 2.



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surrounding pricing pressure and sustainable profitability.”<sup>64</sup> Currently, the typical HDD can store four terabytes (“TB”) of data.<sup>65</sup> If the bits of a fully loaded four-TB HDD are printed on paper in a 12-pt font, the data from the HDD would amount to 9.6 billion pages, equivalent to 957,000 four-drawer file cabinets or enough to fill 65 floors in an office building.<sup>66</sup> There are now HDD models offering storage capacity well over 10 TB.<sup>67</sup>

33. Important characteristics affecting the performance of a disc drive include spindle-rotation speed (related to speed of access to data); interface transfer rate (related to the rate at which data move between disc drives and the computer controller); average seek time (related to the time needed to position heads over a selected track on the disc surface); data transfer rate (related to the rate at which data are transferred to and from the disc); and product quality and reliability.<sup>68</sup>
34. A key measure of storage capacity is areal density, which measures the storage capacity per square inch on the recording surface of a disc.<sup>69</sup> The significant growth in areal density in the HDD industry has been accomplished through innovations in recording media and electronic and mechanical hardware.<sup>70</sup> One technique that increases areal density is Partial Response Maximum Likelihood (“PRML”).<sup>71</sup> PRML is a method for “converting a weak analog signal detected by the head of a magnetic disk or tape drive into a usable digital

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<sup>64</sup> “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 2.

<sup>65</sup> <https://general-animagraffs.netdna-ssl.com/wp-content/uploads/platters-spindle-1.png> (accessed July 10, 2018).

<sup>66</sup> <https://general-animagraffs.netdna-ssl.com/wp-content/uploads/platters-spindle-1.png> (accessed July 10, 2018).

<sup>67</sup> <https://hddmag.com/top-x-largest-hard-drives/> (accessed July 10, 2018).

<sup>68</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2006, at 5-6.

<sup>69</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2006, at 5-6.

<sup>70</sup> <http://www.computerhistory.org/storageengine/software-increases-hardware-areal-density/> (accessed July 10, 2018).

<sup>71</sup> <http://www.computerhistory.org/storageengine/software-increases-hardware-areal-density/> (accessed July 10, 2018).

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signal.”<sup>72</sup> PRML and its successor, Extended Partial Response Maximum Likelihood (“EPRML”), allow areal densities to be increased by 30-40 percent compared with earlier signal detection methods.<sup>73</sup> “Redwing,” a commercial HDD model developed by IBM and shipped for the first time in 1990, offered an areal density of 45 megabits per square inch.<sup>74</sup>

35. In 1856, William Thomson discovered the phenomenon of “anisotropic magnetoresistance (‘AMR’), in which a changing magnetic field induces a resistance change in a conductor.”<sup>75</sup> IBM produced the Model 3660/3663 Point-of-Sale system with an AMR magnetic stripe reader in 1975.<sup>76</sup> In 1990, IBM shipped a commercial HDD loosely based on the AMR technology and code-named “Sawmill” that had an areal density of 107 megabits per square inch.<sup>77</sup> In 1991, head and disk improvements in the IBM Corsair HDD raised the number to 132 megabits per square inch.<sup>78</sup>
36. In 1988, Albert Fert and Peter Grünberg discovered giant magnetoresistance (“GMR”), which relies on alternating layers of atomically thin magnetic and non-magnetic conductive materials.<sup>79</sup> In 1997, IBM introduced the “spin-valve” GMR head with an areal density of 1 gigabit per square inch.<sup>80</sup>

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<sup>72</sup> <http://www.computerhistory.org/storageengine/software-increases-hardware-areal-density/> (accessed July 10, 2018).

<sup>73</sup> <http://www.computerhistory.org/storageengine/software-increases-hardware-areal-density/> (accessed July 10, 2018); <http://www.pcguide.com/ref/hdd/geom/dataEPRML-c.html> (accessed July 10, 2018).

<sup>74</sup> <http://www.computerhistory.org/storageengine/software-increases-hardware-areal-density/> (accessed July 10, 2018).

<sup>75</sup> <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10, 2018).

<sup>76</sup> <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10, 2018).

<sup>77</sup> <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10, 2018).

<sup>78</sup> <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10, 2018).

<sup>79</sup> <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10, 2018).

<sup>80</sup> <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10,

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37. Fert and Grünberg were awarded a Nobel Prize in Physics in 2007 for their discovery of GMR.<sup>81</sup> The discovery has helped “improve data storage density by at least an order of magnitude.”<sup>82</sup> Indeed, “[w]ith the introduction of the GMR head, the storage density CGR was able to increase further to nearly 100% per year (doubling every year) for the next five years,” and “[i]t is thanks to this technology that it has been possible to miniaturize hard disks so radically in recent years.”<sup>83</sup> The discovery “is said to lie at the heart of the operation of modern hard-disk drives with their storage capacities in the gigabyte range. Furthermore, almost anything that operates on the basis of reading vast quantities of internally stored information is said to rely on his work.”<sup>84</sup>
38. In 1974, John Slonczewski proposed that “magnetic tunnel junctions could be used as a ‘Magnetic Gate’.”<sup>85</sup> Tunneling magnetoresistance (“TMR”) involves “electrons moving through an insulating barrier between magnetic layers resulting in a relatively large resistance change between the parallel and anti-parallel orientations of magnetization.”<sup>86</sup>
39. GMR and TMR devices “have a basic common structure, namely, two ferromagnetic metal films separated magnetically by a nonmagnetic film.”<sup>87</sup> The difference between the structures of these devices is “in the nonmagnetic spacer film, which consists of a metal

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2018).

<sup>81</sup> [https://www.nobelprize.org/nobel\\_prizes/physics/laureates/2007/press.html](https://www.nobelprize.org/nobel_prizes/physics/laureates/2007/press.html) (accessed July 10, 2018).

<sup>82</sup> <https://www.technologyreview.com/s/408812/hard-drive-advance-wins-the-nobel-prize/> (accessed July 10, 2018).

<sup>83</sup> Eric E. Fullerton and Jeff R. Childress, “Spintronics, Magnetoresistive Heads, and the Emergence of the Digital World,” *Proceedings of IEEE*, Vol. 104, No. 10, at 1788 (Oct. 2016).

<sup>84</sup> [https://www.washingtonpost.com/local/obituaries/peter-gruenberg-nobel-winning-scientist-who-advanced-computer-technology-dies-at-78/2018/04/10/daa578d0-3c2e-11e8-8d53-eba0ed2371cc\\_story.html](https://www.washingtonpost.com/local/obituaries/peter-gruenberg-nobel-winning-scientist-who-advanced-computer-technology-dies-at-78/2018/04/10/daa578d0-3c2e-11e8-8d53-eba0ed2371cc_story.html) (accessed July 10, 2018).

<sup>85</sup> <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10, 2018).

<sup>86</sup> <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10, 2018).

<sup>87</sup> Hirota E., Sakakima H., Inomata K. (2002) “Physics of GMR and TMR Devices.” *Giant Magneto-Resistance Devices*. Springer Series in Surface Sciences, Vol. 40. Springer, Berlin, Heidelberg, at 11.

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film (GMR) or an insulator film (TMR).<sup>88</sup> TMR heads with an areal density of 84 gigabits per square inch were introduced in 2004 by Seagate.<sup>89</sup> The MR, GMR, and TMR technologies pertain to “magnetoresistive read-heads.”<sup>90</sup>

40. In the mid-1970's, Japanese professor Shun-ichi Iwasaki championed perpendicular magnetic recording (“PMR”).<sup>91</sup> PMR bits align vertically and offer a higher areal density compared to conventional longitudinal magnetic recording (“LMR”) technology.<sup>92</sup> In 2005, Toshiba introduced the world's first HDD with PMR technology, achieving an areal density of 133 gigabits per square inch.<sup>93</sup>

### 3. Marketplace Dynamics

41. One industry analyst estimated that between 1977 and 1995, the total number of HDD shipments increased from approximately 176,000 units annually to just under 100 million units.<sup>94</sup> It was estimated that by 2000, global annual HDD shipments had reached 200 million units.<sup>95</sup>
42. Global HDD shipments continued increasing until 2010.<sup>96</sup> Shipments approached 400

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<sup>88</sup> Hirota E., Sakakima H., Inomata K. (2002) “Physics of GMR and TMR Devices.” *Giant Magneto-Resistance Devices*. Springer Series in Surface Sciences, Vol. 40. Springer, Berlin, Heidelberg, at 11.

<sup>89</sup> <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10, 2018).

<sup>90</sup> <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10, 2018). The MR element, for example, has also been “added alongside an inductive write element to form a merged read/write head” when IBM introduced the Model 3480 “magnetic tape storage unit.” <http://www.computerhistory.org/storageengine/magnetoresistive-read-head-hdd-introduced/> (accessed July 10, 2018).

<sup>91</sup> <http://www.computerhistory.org/storageengine/perpendicular-magnetic-recording-arrives/> (accessed July 10, 2018).

<sup>92</sup> <http://www.computerhistory.org/storageengine/perpendicular-magnetic-recording-arrives/> (accessed July 10, 2018).

<sup>93</sup> <https://phys.org/news/2005-08-toshiba-ships-40gb-inch-perpendicular.html> (accessed July 10, 2018).

<sup>94</sup> “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 5.

<sup>95</sup> “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 5.

<sup>96</sup> “Worldwide unit shipments of hard disk drives (HDD) from 1976 to 2020 (in millions)”, available at <https://www.statista.com/statistics/398951/global-shipment-figures-for-hard-disk-drives/> (accessed on June 9, 2018).

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million units by 2005 and 650 million units by 2010.<sup>97</sup> Throughout this period, Seagate consistently believed that “advances in disc drive capacity, cost per gigabyte, power and ruggedness have enabled growth in demand for digital content,” which along with “a proliferation of non-compute applications in the consumer electronics market, has increased the demand for disc drives used in consumer electronics applications or has indirectly driven the demand for additional disc drives to store, host or back up related media content created by such applications.”<sup>98</sup>

43. Since 2010, HDD shipments globally have been on an almost constant decline. Global annual HDD shipments have decreased from the peak of almost 650 million units in 2010 to less than 500 million units in 2015.<sup>99</sup> According to RBC Capital Markets, quarterly global shipments of HDDs decreased from 118.7 million units in September 2015 to 98.5 million units in June 2016.<sup>100</sup> In annual terms, HDD unit sales declined by approximately 40 percent, from approximately 650 million units in 2010 to 400 million in 2016.<sup>101</sup>
44. Many analysts share the view that global HDD sales have been cannibalized by competing storage solutions, such as solid-state storage devices (“SSDs”).<sup>102</sup> SSDs do not store information on spinning platters as HDDs do, but rely on microchips to read and write

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<sup>97</sup> “Worldwide unit shipments of hard disk drives (HDD) from 1976 to 2020 (in millions)”, available at <https://www.statista.com/statistics/398951/global-shipment-figures-for-hard-disk-drives/> (accessed on June 9, 2018).

<sup>98</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2008, at 7.

<sup>99</sup> “Worldwide unit shipments of hard disk drives (HDD) from 1976 to 2020 (in millions)”, available at <https://www.statista.com/statistics/398951/global-shipment-figures-for-hard-disk-drives/> (accessed on June 9, 2018).

<sup>100</sup> “Hard Disk Drive Model Update Post June-Qtr Earnings,” RBC Capital Markets, August 10, 2016, at 4.

<sup>101</sup> Edward Parker, “Data and Cloud Infrastructure: Seagate Technology PLC,” BTIG, October 6, 2016, at 3.

<sup>102</sup> See, e.g., Edward Parker, “Data and Cloud Infrastructure: Seagate Technology PLC,” BTIG, October 6, 2016; Aaron Rakers, Joe Quatrochi, and Jake Wilhelm, “STX: Resuming Coverage at Market Perform,” Wells Fargo Securities, November 14, 2017; John Roy, “Seagate Technology PLC: PC Declines and Next Generation Flash Coming – Initiate with a Sell,” UBS Global Research, September 10, 2015; Karl Ackerman, Timothy Arcuri, and Wayne Loeb, “Initiation: Revamped Cost Structure Weathers Storm; Growth Remains Elusive,” Cowen and Company, April 11, 2016.

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information.<sup>103</sup> Advantages of SSDs over HDDs include longer battery life, shorter boot time, and higher copy/write speed.<sup>104</sup> While SSDs are expected to continue to encroach on HDD sales in the PC marketplace, HDDs may continue to dominate in high-capacity raw storage applications where they offer considerable cost advantages.<sup>105</sup>

45. The HDD business has been characterized by decreasing average selling prices (“ASPs”). The ASP of HDDs decreased from the peak of \$12,000 per unit in 1977 to \$299 per unit in 1995, and to below \$60 per unit in 2010.<sup>106</sup> A similar trend has been observed in the ASPs of HDDs measured in per-gigabyte terms. The average price per GB has been steadily decreasing since 2009, from approximately \$0.11 per GB to less than \$0.03 per GB in 2017.<sup>107</sup>
46. The decrease in ASP applies across HDDs of all capacities and purposes. For example, the average price per GB for HDDs of 4 TB capacity has decreased from over \$0.07 per GB in 2012 to approximately \$0.02 per GB in 2016.<sup>108</sup> In 2015, the price of HDDs dropped to approximately \$0.06 per GB in notebooks and \$0.04 per GB in PCs, translating into approximate ASPs of \$45 and \$52 in notebooks and PCs with average storage capacities of approximately 750 GB and 1.2 TB respectively.<sup>109</sup>
47. Vigorous HDD competition has occurred hand-in-hand with significant consolidation in the industry. It is estimated that the number of HDD vendors decreased from a peak of 85

<sup>103</sup> See, e.g., [http://www.storagereview.com/ssd\\_vs\\_hdd](http://www.storagereview.com/ssd_vs_hdd) (accessed July 10, 2018).

<sup>104</sup> See, e.g., [http://www.storagereview.com/ssd\\_vs\\_hdd](http://www.storagereview.com/ssd_vs_hdd) and <https://flashdba.com/2014/06/06/understanding-flash-what-is-nand-flash/> (accessed July 10, 2018).

<sup>105</sup> Karl Ackerman, Timothy Arcuri, and Wayne Loeb, “Initiation: Revamped Cost Structure Weathers Storm; Growth Remains Elusive,” Cowen and Company, April 11, 2016, at 15.

<sup>106</sup> “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 5.

<sup>107</sup> <https://www.backblaze.com/blog/hard-drive-cost-per-gigabyte/> (accessed July 10, 2018).

<sup>108</sup> <https://www.backblaze.com/blog/hard-drive-cost-per-gigabyte/> (accessed July 10, 2018).

<sup>109</sup> Karl Ackerman, Timothy Arcuri, and Wayne Loeb, “Initiation: Revamped Cost Structure Weathers Storm; Growth Remains Elusive,” Cowen and Company, April 11, 2016, at 16.

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in 1985, to six major players in 2006, driven largely by a series of acquisitions intended to increase economies of scale to reduce costs.<sup>110</sup> In 2003 alone, IBM sold its Data Storage Division to Hitachi, forming Hitachi Global Storage Technologies (“HGST”),<sup>111</sup> and Western Digital acquired Read-Rite.<sup>112</sup> In 2006, Seagate acquired Maxtor, creating the then-largest HDD manufacturer in the marketplace.<sup>113</sup>

48. This trend continued in subsequent years. In April 2009, Fujitsu, one of the other major HDD manufacturers, sold its HDD business segment to Toshiba;<sup>114</sup> in June 2010, Western Digital completed its acquisition of the magnetic media operations of Hoya Corporation and Hoya Magnetics Singapore Pte. Ltd.;<sup>115</sup> in 2011, Seagate completed the acquisition of Samsung’s HDD business;<sup>116</sup> and in 2012, Western Digital acquired HGST<sup>117</sup> and Seagate acquired a controlling interest in LaCie.<sup>118</sup>

49. In the wake of these acquisitions, Seagate, Toshiba, and Western Digital remain the last

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<sup>110</sup> “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 2.

<sup>111</sup> “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 54; Rex Farrance, “Timeline: 50 Years of Hard Drives,” PCWorld, available at <https://www.pcworld.com/article/127105/article.html> (accessed May 4, 2018).

<sup>112</sup> “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 62.

<sup>113</sup> “The Hard Disk Drive Industry Overview,” A.G. Edwards Analyst Report, August 21, 2006, at 10, 34; Rex Farrance, “Timeline: 50 Years of Hard Drives,” PCWorld, available at <https://www.pcworld.com/article/127105/article.html> (accessed May 4, 2018). *See also*, Tab 4.

<sup>114</sup> “Toshiba to Acquire Fujitsu’s Hard-disk Drive Business,” available at <https://www.pcworld.com/article/159631/article.html> (accessed June 14, 2018); “Toshiba and Fujitsu Conclude Definitive Agreement on HDD Business Transfer,” available at <http://www.fujitsu.com/global/about/resources/news/press-releases/2009/0430-09.html> (accessed June 14, 2018).

<sup>115</sup> “WD® Completes Acquisition of Hoya’s Magnetic Media Operations,” available at <https://www.wdc.com/about-wd/newsroom/press-room/2010-06-30-wd-completes-acquisition-of-hoyas-magnetic-media-operations.html> (accessed June 14, 2018).

<sup>116</sup> “Seagate Completes Acquisition of Samsung’s Hard Disk Drive Business,” available at <https://www.seagate.com/about-seagate/news/seagate-completes-aquisition-samsungs-hdd-business-pr/> (accessed June 14, 2018).

<sup>117</sup> “WD Acquires HGST,” available at <https://www.wdc.com/about-wd/newsroom/announcements/wdc-acquires-hgst.html> (accessed May 4, 2018).

<sup>118</sup> “Seagate and LaCie Announce Completion of the Acquisition of a Controlling Interest in LaCie,” available at <https://www.seagate.com/about-seagate/news/seagate-lacie-completion-acquisition-controlling-interest-master-pr/> (accessed June 14, 2018).



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significant competitors in the HDD industry.<sup>119</sup> Tab 4 illustrates annual overall HDD unit share by vendor from 2006 through 2017. In 2010, Seagate HDD unit shipments accounted for approximately 30 percent of overall shipments, with Western Digital, Hitachi, Samsung, and Toshiba comprising the rest.<sup>120</sup> By 2017, Seagate's share had grown to 37 percent, with Western Digital and Toshiba comprising the remaining 40 percent and 23 percent, respectively.<sup>121</sup>

50. In addition, HDD manufacturers have become more vertically integrated, manufacturing the various components that ultimately comprise their HDD products.<sup>122</sup>

### **C. Patent-in-Suit**

#### **1. Overview**

51. The '988 Patent was issued on October 31, 2006 and is titled "Magnetic Material Structures, Devices and Methods."<sup>123</sup> I understand that LMS alleges that the claimed invention of the '988 Patent is used in the write pole of recording heads used in HDDs.<sup>124</sup>

The abstract for the '988 patent reads,

A thin film magnetic structure, magnetic devices, and method of producing the same, wherein (110) textured, symmetry broken body centered cubic or body centered cubic derivative crystalline structures epitaxially grown on hexagonal shaped templates, in the presence of a symmetry breaking mechanism is provided to promote oriented uniaxial magnetic properties from a series of successively deposited film layers, result in new oriented magnetic layer structures and microstructures and thus improved magnetic devices and device performance.<sup>125</sup>

<sup>119</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2017, at 8.

<sup>120</sup> Tab 4.

<sup>121</sup> Tab 4. An analyst report from 2016 estimated that, in June 2017, Seagate's unit-based market share would equal 38 percent, while Western Digital would account for 45 percent, and Toshiba for 17 percent. "Hard Disk Drive Model Update Post June-Qtr Earnings," RBC Capital Markets, August 10, 2016, at 4.

<sup>122</sup> See, e.g., "The Hard Disk Drive Industry Overview," AG Edwards Analyst Report, August 21, 2006, at 2.

<sup>123</sup> U.S. Patent No. 7,128,988.

<sup>124</sup> Lambeth 02/26 Deposition, at 41. See also, Lawton Report, ¶ 124.

<sup>125</sup> U.S. Patent No. 7,128,988 at Abstract.



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52. The '988 Patent describes "a thin-film structure with a magnetic layer grown over a crystalline 'template' layer, so that the crystals of the magnetic layer can form in six possible orientations."<sup>126</sup> According to Dr. Caroline A. Ross, "the alleged inventive aspect of the '988 Patent lies in its theory that magnetic crystals with particular crystalline orientations ('variants'), if grown together in certain combinations and exchange-coupled, can potentially produce a magnetic property known as 'uniaxial anisotropy.'"<sup>127</sup> LMS claims that "[t]his new magnetic structure allowed Hard Disk Drive Devices with greater capacity than before, but without an increase in their physical size."<sup>128</sup>
53. Dr. Ross has concluded that "the '988 Patent would not have enabled a person of ordinary skill in the art at the time of the filing of the application for the '988 Patent to make and use the full scope of any of the Asserted Claims without undue experimentation," that "the '988 Patent does not provide an adequate written description of the invention claimed in any of the Asserted Claims," and that "the Asserted Claims all claim patent-ineligible subject matter."<sup>129</sup>
54. As described above, there are multiple components and subcomponents incorporated in an HDD. The following series of figures are provided to indicate the approximate location of the write pole, where the technology covered by the '988 Patent is allegedly practiced.
55. Figure 1 presents a bird's-eye visual of an HDD, showing, among other components, the head stack assembly ("HSA").<sup>130</sup>

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<sup>126</sup> Ross Report, ¶ 27.

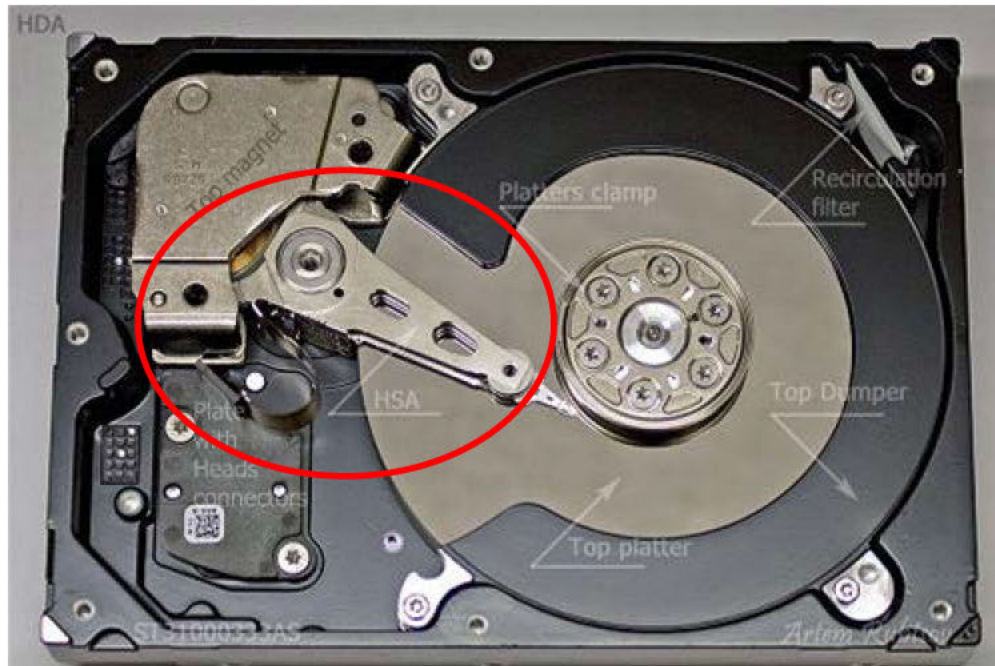
<sup>127</sup> Ross Report, ¶ 26.

<sup>128</sup> Complaint, ¶ 18.

<sup>129</sup> Ross Report, at 6.

<sup>130</sup> [http://hddscan.com/doc/HDD\\_from\\_inside.html](http://hddscan.com/doc/HDD_from_inside.html) (accessed July 10, 2018).

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**Figure 1**

56. Figure 2 depicts the anatomy of an HSA, which shows, among other components, the HGA.<sup>131</sup>

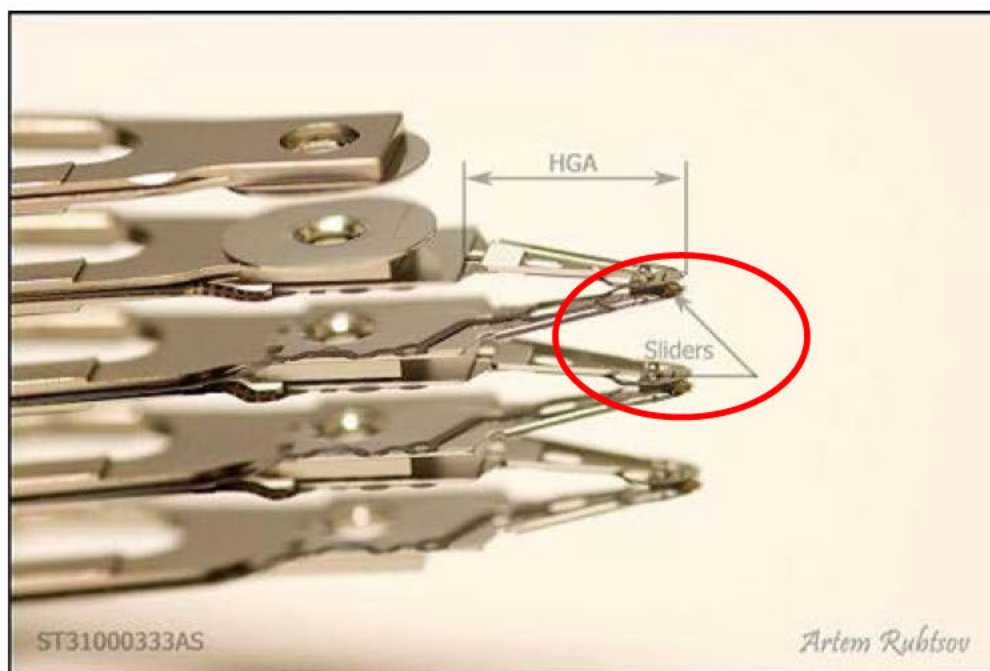


**Figure 2**

<sup>131</sup> [http://hddscan.com/doc/HDD\\_from\\_inside.html](http://hddscan.com/doc/HDD_from_inside.html) (accessed July 10, 2018).

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57. Figure 3 provides a close-up visual that shows the location of a slider (or “wafer level slider”) within an HGA.<sup>132</sup>



**Figure 3**

58. Figure 4 provides a close-up visual of a slider, which shows the approximate location of the read and write elements. According to Dr. Fullerton, the slider contains multiple features, including among others, “a heater and an air bearing surface, both of which assist with maintaining a desired spacing between the slider and the disk,” as well as between the read and write heads.<sup>133</sup> The read head is “a component of the slider with multiple thin films that work together to sense (*i.e.*, read) magnetic transitions on the disk ... [and t]he write head consists of multiple components (*e.g.*, shields, write pole, coils) that work together to record magnetic transitions to the disk.”<sup>134</sup> The write pole, which is the subcomponent to which the claimed invention of the ‘988 Patent is directed, is one of the

<sup>132</sup> [http://hddscan.com/doc/HDD\\_from\\_inside.html](http://hddscan.com/doc/HDD_from_inside.html) (accessed July 10, 2018).

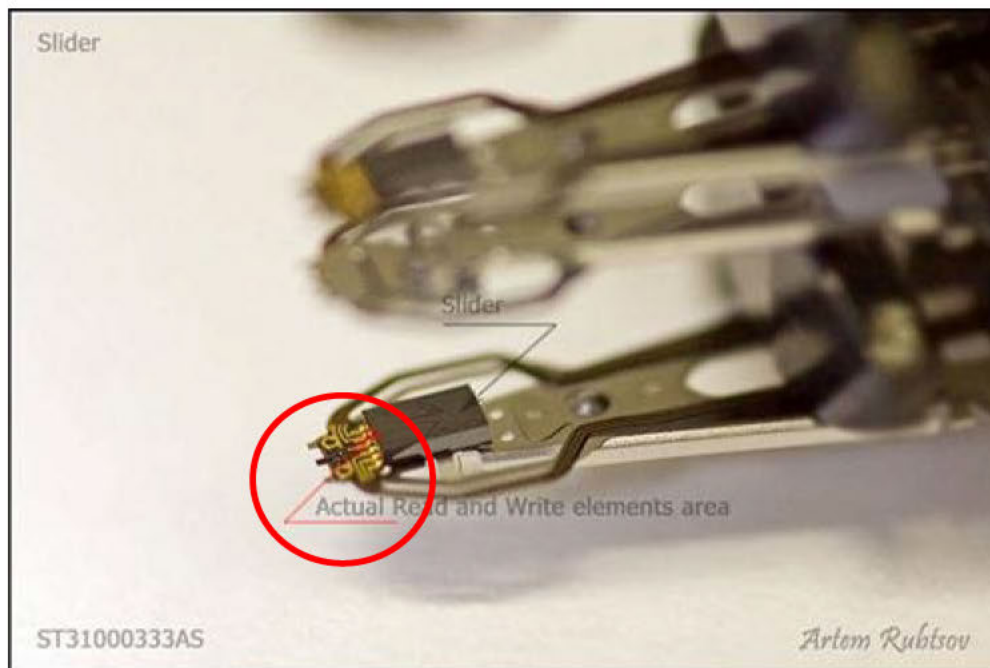
<sup>133</sup> Fullerton Report, ¶ 151.

<sup>134</sup> Fullerton Report, ¶ 151.



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elements in this area of the slider.<sup>135</sup>



**Figure 4**

## **2. Ownership and License History**

59. On October 31, 2006, the '988 Patent was assigned to LS,<sup>136</sup> a sole proprietorship of Dr. David N. Lambeth.<sup>137</sup> Since then, the ownership of the '988 patent has changed hands three times, and rights under the patent have been shared in several ways with non-Lambeth entities.

### **a. Acacia Acquisition**

60. In the four-year period after obtaining the rights to the '988 Patent, LS did not manufacture or sell any product that used the invention claimed in the '988 Patent, and did not enter into any license agreements for the '988 Patent.<sup>138</sup>

61. In December 2010, LS assigned, conveyed, transferred, and sold the entire right, title, and

<sup>135</sup> [http://hddscan.com/doc/HDD\\_from\\_inside.html](http://hddscan.com/doc/HDD_from_inside.html) (accessed July 10, 2018).

<sup>136</sup> U.S. Patent No. 7,128,988.

<sup>137</sup> Lambeth 02/26 Deposition, at 7.

<sup>138</sup> Lambeth 02/26 Deposition, at 42-45 and 301-303.

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interest in and to the '988 Patent, as well as its foreign equivalents, to SBS Magnetics, LLC ("SBS"),<sup>139</sup> a subsidiary of Acacia Research Corporation (collectively, "Acacia").<sup>140</sup>

62. Acacia is a company originally incorporated in California in January 1993 and reincorporated in Delaware 1999.<sup>141</sup> Acacia partners with inventors and patent owners, and acts as an intermediary in the patent marketplace.<sup>142</sup> According to Mr. Phillip Mitchell, Acacia's 30(b)(6) witness in this matter, "the predominant way that [Acacia] monetize[s] intellectual property for its clients] is by taking intellectual property that is not currently licensed to a series of ... potential infringers and approach[es] them, usually through a court case, and to then end[s] up licensing them in the end."<sup>143</sup>
63. Through the end of the fiscal year ending on December 31, 2017, Acacia had licensed and enforced over 1,550 license agreements (unrelated to the '988 Patent), across 193 patent portfolio licensing and enforcement programs with both large and small companies.<sup>144</sup> According to Acacia, through the end of 2017, it had generated gross licensing revenue of approximately \$1.4 billion and returned more than \$731 million to patent partners.<sup>145</sup>
64. According to Dr. Lambeth, when he sold the '988 Patent to Acacia, he had expected that Acacia would be able to license the '988 Patent because Acacia had more experience and resources than he did.<sup>146</sup> In exchange for the rights to the '988 Patent and its foreign

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<sup>139</sup> Mitchell Deposition, at Exhibit 2 (ARC00622-ARC00640 at ARC00622 ¶1.1). U.S.P.T.O. patent assignment 026405/0629, available at <https://assignment.uspto.gov/patent/index.html#/patent/search/resultAssignment?id=26405-629>. (accessed July 10, 2018).

<sup>140</sup> Mitchell Deposition, at 14.

<sup>141</sup> Acacia Research Corporation SEC Form 10-K for the fiscal year ended December 31, 2017, at 3.

<sup>142</sup> Acacia Research Corporation SEC Form 10-K for the fiscal year ended December 31, 2017, at 3.

<sup>143</sup> Mitchell Deposition, at. 13-14.

<sup>144</sup> Acacia Research Corporation SEC Form 10-K for the fiscal year ended December 31, 2017, at 3; and Mitchell Deposition, at 36-37.

<sup>145</sup> Acacia Research Corporation SEC Form 10-K for the fiscal year ended December 31, 2017, at 3.

<sup>146</sup> Lambeth 02/26 Deposition, at 301-302.

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equivalents,

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## **b. Acacia License and Option Agreements**

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66.

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<sup>147</sup> Mitchell Deposition, at Exhibit 2 (ARC00622-40 at ARC00622-23, ¶ 2.1).

<sup>148</sup> Mitchell Deposition, at Exhibit 2 (ARC00622-40 at ARC00624, ¶¶ 2.3-2.4).

149

150

<sup>151</sup> Mitchell Deposition, at Exhibit 16, at 2.

<sup>152</sup> Mitchell Deposition, at 44 and Exhibit 3 (ARC003093-189 at ARC0003095, ¶ 2.1).

153 ARC003093-189 at ARC0003155-89.

<sup>154</sup> ARC003093-189 at ARC0003095, ¶ 2.1.

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67.



155 Mitchell Deposition, at 45.  
156 LAMBETH-000224014-31 at LAMBETH-000224014.  
157 Mitchell Deposition, at Exhibit 7 (ARC0003193).  
158 Mitchell Deposition, at Exhibit 7 (ARC0003211-19).  
159 Mitchell Deposition, at Exhibit 7 (ARC0003194).  
160 Mitchell Deposition, at Exhibit 7 (ARC0003190).  
161 Mitchell Deposition, at Exhibit 7 (ARC0003190, 197).

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[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED] [REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

<sup>162</sup> Mitchell Deposition, at Exhibit 7 (ARC0003197).

<sup>163</sup> Mitchell Deposition, at Exhibit 7 (ARC0003198).

<sup>164</sup> Mitchell Deposition, at Exhibit 7 (ARC0003199).

<sup>165</sup> Mitchell Deposition, at Exhibit 4 (ARC0002952).

<sup>166</sup> Mitchell Deposition, at Exhibit 4 (ARC0003023, A2.1).

<sup>167</sup> Mitchell Deposition, at Exhibit 4 (ARC0003021, A1.2).

<sup>168</sup> Mitchell Deposition, at Exhibit 4 (ARC0002951, A1.4).

<sup>169</sup> Mitchell Deposition, at Exhibit 4 (ARC0002951, A1.4).

170 Mitchell Deposition, at Exhibit 4 (ARC0003023, A2.2).

<sup>171</sup> Mitchell Deposition, at Exhibit 4 (ARC0003021, A1.3).

<sup>172</sup> Deposition of Steven Fricke, September 12, 2017, (“Fricke Deposition”), at 16-17.



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72.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**c. Acacia Reassignment**

75. On March 1, 2013, LS commenced litigation against Acacia and SBS, in which it alleged that Acacia and SBS breached the December 2010 agreement with LS [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

<sup>173</sup> Mitchell Deposition, at Exhibit 4 (ARC0002952, 957).

<sup>174</sup> ARC0003389-450, at ARC0003389.

<sup>175</sup> ARC0003389-450, at ARC0003394.

<sup>176</sup> ARC0003389-450, at ARC0003390.

<sup>177</sup> ARC0003389-450, at ARC0003391.

<sup>178</sup> Mitchell Deposition, at Exhibit 16, at 2.

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<sup>179</sup> Acacia denied Lambeth's allegations.<sup>180</sup>

76.

When Acacia and SBS assigned the rights to the ‘988 Patent back to Lambeth in 2013, Acacia and SBS knew that there were four other “potential licensees” for the ‘988 Patent—Seagate, Western Digital, Hitachi Global Storage, and Toshiba.<sup>183</sup>

#### d. LS Assignment

77. In March 2014, LS assigned the ‘988 Patent to LMS in exchange for \$1.<sup>184</sup> For its tax purposes, LMS needed to assign a value to the assets that were transferred from LS.<sup>185</sup> I understand that the ‘988 Patent was assigned a value of \$463,000, which reflected Dr. Lambeth’s understanding of the value or “net worth” of the company’s assets.<sup>186</sup>

#### e. Lambeth Settlement and License with TDK

78. On November 6, 2014, LMS commenced litigation against Toshiba Corporation, in which LMS alleged that Toshiba infringed the ‘988 Patent.<sup>187</sup> On June 24, 2016, LMS filed a

<sup>179</sup> LAMBETH-000224014-31, at LAMBETH-000224014.

180 Mitchell Deposition, at Exhibit 21.

181 Mitchell Deposition, at 71.

<sup>182</sup> LAMBETH-000224014-31, at LAMBETH-000224015, 30-31.

<sup>183</sup> Mitchell Deposition, at 72.

<sup>184</sup> LAMBETH-000139370-72, at LAMBETH-000139370; and Lambeth 02/26 Deposition, at 85-86.

<sup>185</sup> Lambeth 02/26 Deposition, at 82.

186 Lambeth 02/26 Deposition, at 83-88. According to Dr. Lambeth's tax documents, the value of the 15 percent ownership shares that were gifted to each of his children amounted to \$69,450. This implies a total value of LMS of \$463,000. *See, e.g.*, LAMBETH-000310374; LAMBETH-000310375-79; LAMBETH-000310380-84; LAMBETH-000310385-96.

<sup>187</sup> *Lambeth Magnetic Structures, LLC v. Toshiba Corporation, et al.*, Civ. No. 2:14-cv-01526-CB (W.D. Pa.), Dkt.

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Third Amended Complaint, naming TDK Corporation (“TDK”) and related parties, in which LMS alleged that TDK infringed the ‘988 Patent.<sup>188</sup> Thereafter, defendants SAE Magnetics H.K. Ltd., Headway Technologies, Inc. and TDK all moved to dismiss the Third Amended Complaint for lack of personal jurisdiction, and the court granted their motion dismissing them from the case on March 1, 2017.<sup>189</sup>

79. On March 30, 2017, LMS and TDK entered into a Settlement and Patent License Agreement covering the ‘988 Patent.<sup>190</sup> Pursuant to the agreement, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]<sup>193</sup>

**D. Accused Products**

80. LMS has alleged that Seagate infringes the ‘988 Patent by “making, using, selling, offering to sell, and/or importing magnetic heads that are incorporated in Hard Disk Drive

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No. 1.

<sup>188</sup> *Lambeth Magnetic Structures, LLC v. Toshiba Corporation, et al.*, Civ. No. 2:14-cv-01526-CB (W.D. Pa.), Dkt. No. 82; LAMBETH-000222078-98, at LAMBETH-000222079; and <https://portal.unifiedpatents.com/litigation/profile/2:14-cv-01526/Pennsylvania%20Western%20District%20Court> (accessed April 25, 2018)

<sup>189</sup> *Lambeth Magnetic Structures, LLC v. Toshiba Corporation, et al.*, Civ. No. 2:14-cv-01526-CB (W.D. Pa.), Dkt. No. 172.

<sup>190</sup> LAMBETH-000222078-98, at LAMBETH-000222078.

<sup>191</sup> LAMBETH-000222078-98, at LAMBETH-000222083 and 85.

<sup>192</sup> LAMBETH-000222078-98, at LAMBETH-000222082.

<sup>193</sup> LAMBETH-000222078-98, at LAMBETH-000222088.

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Devices.”<sup>194</sup> Specifically, LMS has alleged that the accused “Hard Disk Drive Devices” include,

computers, electronic equipment, and hard disk drives with magnetic heads and *perpendicular magnetic recording* media, including but not limited to: hard disk drives, including hard disk drives for inclusion in computers; stand-alone drives and portable drives; laptop and desktop computers with hard disk drives; media players and sound or video recording devices with hard disk drives; gaming systems with hard disk drives; servers and enterprise storage computers; hard disk drive storage devices in automotive vehicles and machinery; and other devices with hard disk drives, including the components such as recording heads and media for such drives.<sup>195</sup>

LMS has alleged that an infringing drive “includes at least one magnetic hard disk along with at least one *recording head* for writing data to the surface(s) of the magnetic hard disk” and “at least *one recording head* made from Dr. Lambeth’s new magnetic material structure.”<sup>196</sup>

81. LMS has identified approximately 3,800 Seagate products that have allegedly infringed the ‘988 Patent.<sup>197</sup> I refer to these devices collectively as the “Accused Products.” Between April 29, 2010 and December 31, 2017, Seagate sold 1.4 billion units of Accused Products worldwide, the revenue from which accounted for 99.97 percent of Seagate’s total revenue from HDD sales during the same period.<sup>198</sup>

### **III. DAMAGES FRAMEWORK**

82. Recovery for patent infringement is governed by 35 U.S.C. § 284:

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<sup>194</sup> Complaint, at 6.

<sup>195</sup> Complaint, at 3 (*emphasis added*).

<sup>196</sup> Complaint, at 5 (*emphasis added*).

<sup>197</sup> Plaintiff Lambeth Magnetic Structures, LLC’s Amended Disclosure of Asserted Claims and Infringement Contentions, November 29, 2017 (“Amended Infringement Contentions”), at 4-21.

<sup>198</sup> Tab 5.A at [6][I] and [12][I].

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[u]pon finding for the claimant the Court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer...

83. This provision has been interpreted to mean that the holder of an infringed patent should be placed in the same financial position it would have been in had its patent not been infringed.<sup>199</sup> If infringement is found, the patent holder is entitled to receive as damages the value of the asset that was taken.<sup>200</sup>
84. In some cases, an appropriate measure of damages is lost profits. Lost profits typically represent the additional sales and corresponding profits on those sales that the patent holder would have made had there been no infringement. It is my understanding that LS and LMS do not sell and have not sold any product or service that competes with the Accused Products.<sup>201</sup> As a result, Plaintiff's expert, Ms. Lawton, and I agree that LS and LMS did not lose any sales-related profits due to Seagate's allegedly infringing activity.
85. For infringing sales on which lost profits are not appropriate, a patent holder who is able to establish liability for patent infringement may be entitled to no less than "a reasonable royalty for the use made of the invention by the infringer."<sup>202</sup> A reasonable royalty represents the payment or stream of payments that the alleged infringer should have paid for using the patent holder's technology. Usually, the amount of a reasonable royalty payment is computed initially by making reference to what the two parties should have

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<sup>199</sup> *Aro Manufacturing Co., Inc. v. Convertible Top Replacement Co., Inc.*, 377 U.S. 476, 507 (1964); *Lucent Techs., Inc., et al v. Gateway, Inc., et al.*, 580 F.3d 1301, 1324 (Fed. Cir. 2009).

<sup>200</sup> *See Trell v. Marlee Electronics Corp.*, 912 F.2d 1443, 1446-47 (Fed. Cir. 1990) (indicating that the measure of damages in a patent case is the value of "that which the defendant has appropriated."). *See also, Dowagiac Mfg. Co. v. Minnesota Moline Plow Co.*, 235 U.S. 641, 648 (1915) ("[T]he normal measure of damages [is] the value of what was taken."); *Faulkner v. Gibbs*, 199 F.2d 635, 638 (9th Cir. 1952) (Damages are "measured ordinarily by the fair value of what was taken, i.e., the privilege of making, using or selling the patented article.").

<sup>201</sup> Lawton Report, ¶71.

<sup>202</sup> 35 U.S.C. § 284.

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agreed upon at the point of first alleged infringement. In this matter, Ms. Lawton and I agree that reasonable royalty damages would serve as the appropriate basis for estimating the economic harm to LMS, should the '988 Patent be found to be valid and infringed.

**A. Reasonable Royalty Overview**

86. As I understand it, courts generally are afforded some degree of discretion and latitude in making reasonable royalty determinations,<sup>203</sup> and fact-finders have relied upon a range of approaches and evidence in making such determinations.<sup>204</sup> The court in *Georgia-Pacific* explained:

[T]here is a multiplicity of inter-penetrating factors bearing upon the amount of a reasonable royalty. But *there is no formula* by which these factors can be rated precisely in the order of their relative importance or by which their economic significance can be automatically transduced into their pecuniary equivalent. In discharging its responsibility as fact finder, the Court has attempted to exercise a discriminating judgment reflecting its ultimate *appraisal of all pertinent factors* in the context of the credible evidence.<sup>205</sup>

87. Since its issuance, the *Georgia-Pacific* decision has become “the touchstone of modern reasonable royalty analysis” and “established principles that have been used by virtually every court since in determining a reasonable royalty.”<sup>206</sup> The court in *Georgia-Pacific* identified a non-exhaustive list of factors that may be relevant for the determination of a reasonable royalty in a patent infringement case. There are fifteen factors:

1. The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty.
2. The rates paid by the licensee for the use of other patents comparable to the patent in suit.

<sup>203</sup> *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971).

<sup>204</sup> *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120-21 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971).

<sup>205</sup> *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120-21 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971) (*emphasis added*).

<sup>206</sup> Richard F. Cauley, *Winning the Patent Damages Case*, Oxford University Press (2009), at 7, 12.

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3. The nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold.
4. The licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.
5. The commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promotor.
6. The effect of selling the patented specialty in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales.
7. The duration of the patent and the term of the license.
8. The established profitability of the product made under the patent; its commercial success; and its current popularity.
9. The utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results.
10. The nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.
11. The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use.
12. The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions.
13. The portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer.
14. The opinion testimony of qualified experts.
15. The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee – who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention – would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.<sup>207</sup>

88. In addition to these considerations (which are often referred to as the “*Georgia-Pacific*

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<sup>207</sup> *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971).

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factors”), courts have articulated a number of other principles to consider in the determination of a reasonable royalty in a patent infringement proceeding. The U.S. Supreme Court in *Aro Manufacturing Co.* described an appropriate damages award, of which a reasonable royalty is one form, as “compensation for the pecuniary loss ... [the patentee] has suffered from the infringement, without regard to the question whether the defendant has gained or lost by his unlawful acts.”<sup>208</sup> The Federal Circuit has added that “the purpose of compensatory damages is not to punish the infringer, but to make the patentee whole.”<sup>209</sup>

89. With regard to the scope of coverage of a reasonable royalty, the Federal Circuit has emphasized that “the trial court must carefully tie proof of damages to the claimed invention’s footprint in the market place.”<sup>210</sup> It has warned that “evidence unrelated to the claimed invention does not support compensation for infringement but punishes beyond the reach of the statute.”<sup>211</sup>
90. Further, “[t]he Federal Circuit ‘requires sound economic proof of the nature of the market and likely outcomes with infringement factored out of the economic picture’ in all damages calculations.”<sup>212</sup> Moreover, it requires “sound economic and factual predicates” to support the analysis of a reasonable royalty.<sup>213</sup>

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<sup>208</sup> *Aro Manufacturing Co., Inc., v. Convertible Top Replacement Co., Inc.*, 377 U.S. 476, 507 (1964) (citing *Coupe v. Royer*, 155 U.S. 565, 582). *See also, ResQNet.com, Inc., v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010) (“At all times, the damages inquiry must concentrate on compensation for the economic harm caused by infringement of the claimed invention.”).

<sup>209</sup> *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1223 (Fed. Cir. 1995).

<sup>210</sup> *ResQNet.com, Inc., v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010).

<sup>211</sup> *ResQNet.com, Inc., v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010).

<sup>212</sup> *IP Innovation L.L.C. v. Red Hat, Inc.*, 705 F. Supp. 2d 687, 689, 2010 U.S. Dist. LEXIS 28372 (E.D. Tex. 2010) (citing *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d 1341, 1350 (Fed. Cir. 1999)).

<sup>213</sup> *IP Innovation L.L.C. v. Red Hat, Inc.*, 705 F. Supp. 2d 687, 689, 2010 U.S. Dist. LEXIS 28372 (E.D. Tex. 2010) (citing *Riles v. Shell Exploration & Production Co.*, 298 F.3d 1302, 1311 (Fed. Cir. 2002)).



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**B. Hypothetical Negotiation Construct**

**1. Overview**

91. One of the most common tools used in reasonable royalty determinations is the “hypothetical negotiation” construct, which frames the analysis using a hypothetical arm’s length negotiation for a license to practice the patent(s)-at-issue between a willing patent owner and a willing potential licensee at the point of first alleged infringement.<sup>214</sup> This construct is reflected in *Georgia-Pacific* Factor 15. In applying the hypothetical negotiation construct in the analysis of reasonable royalty damages, the negotiation is conducted using several assumptions:

1. the patent is known to be valid and enforceable at the time infringement commences;
2. the patent is known to be infringed;
3. the patent holder is willing to issue a license;
4. the licensee is willing to take a license; and
5. the appropriate relevant business facts (even subsequent to the point of negotiation) are deemed known to both parties.<sup>215</sup>

92. Although the hypothetical negotiation construct is a useful tool for analyzing a reasonable royalty, courts have cautioned that a negotiation conducted after infringement has occurred

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<sup>214</sup> See *Riles v. Shell Exploration and Production Co.*, 298 F.3d 1302, 1311 (Fed. Cir. 2002) (“A ‘reasonable royalty’ contemplates a hypothetical negotiation between the patentee and the infringer at a time before the infringement began.”). See also, *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1078 (Fed. Cir. 1983); *Lucent Techs., Inc., et al v. Gateway, Inc., et al*, 580 F.3d 1301, 1325 (Fed. Cir. 2009) (“The hypothetical negotiation tries, as best as possible, to recreate the *ex ante* licensing negotiation scenario and to describe the resulting agreement. In other words, if infringement had not occurred, willing parties would have executed a license agreement specifying a certain royalty payment scheme. The hypothetical negotiation also assumes that the asserted patent claims are valid and infringed.”). In *Lucent*, the Federal Circuit suggested that the hypothetical negotiation construct was an *alternative* to “the analytical method” (which focuses on the allocation of an infringer’s profits attributable to the accused products) in the assessment of reasonable royalty. See *Lucent Techs., Inc., et al v. Gateway, Inc., et al*, 580 F.3d 1301, 1324-25 (Fed. Cir. 2009). In this report, information derived from the various valuation methodologies, including the analytical method, is used in the context of the hypothetical negotiation construct to determine a reasonable royalty.

<sup>215</sup> See Paul M. Janicke, “Contemporary Issues in Patent Damages,” 42 *AM. UNIV. L.R.* 691, 722-24 (Spring 1993).

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(and been proven) is not the same as a negotiation between truly willing parties prior to the date of first infringement.<sup>216</sup> The court in *Panduit* explained the difference:

The setting of a reasonable royalty after infringement cannot be treated ... as the equivalent of ordinary royalty negotiations among truly “willing” patent owners and licensees. That view would constitute a pretense that the infringement never happened. It would also make an election to infringe a handy means for competitors to impose a “compulsory license” policy upon every patent owner. ... As said by this court in another context, the infringer would be in a “heads-I-win, tails-you-lose” position.<sup>217</sup>

93. In other words, in applying the hypothetical negotiation construct, one must be mindful not to under-compensate the patent holder for the alleged infringement and, thereby, create incentives for a potential infringer to use infringement as a means of obtaining an advantageous compulsory license.
94. At the same time, the fact that the hypothetical negotiation is assumed to take place at the point of first infringement (*i.e.*, after the alleged infringer has committed resources to the allegedly infringing activity) creates a risk that the patent holder would be able to extract concessions in a hypothetical negotiation that exceed the actual contribution made by the allegedly infringed patent to the value of the allegedly infringing product – a circumstance referred to as “hold-up” in economics.<sup>218</sup> In effect, by the time of the hypothetical negotiation, the options available to the alleged infringer to avoid infringement may have narrowed sufficiently that a patent holder would be in a position in a negotiation to extract a share of the profits generated by the alleged infringement that is disproportionate to the contribution made by the patent-at-issue. As noted above, reasonable royalty damages should not include amounts beyond that which was contributed by the patent-at-issue, so

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<sup>216</sup> See, e.g., *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152 (6th Cir. 1978); *Stickle v. Heublein, Inc.*, 716 F.2d 1550 (Fed. Cir. 1983).

<sup>217</sup> *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1158 (6th Cir. 1978) (citation omitted).

<sup>218</sup> Mark A. Lemley and Carl Shapiro, “Patent Holdup and Royalty Stacking,” 85 *Texas Law Review* 1991 (2007).

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the potential for hold-up (or exclusion of an entire product or service line from the marketplace) creates a risk of over-compensating the patent holder for the infringement.

95. Given the challenges associated with the application of the hypothetical negotiation construct, the Federal Circuit has noted that “[t]he willing licensee/licensor approach must be flexibly applied as a ‘device in the aid of justice.’”<sup>219</sup> One particular dimension of flexibility that is incorporated into the analysis of a hypothetical negotiation is consideration of the “book of wisdom,”<sup>220</sup> which includes “facts and circumstances that may have occurred after the time of infringement in determining what negotiators would have decided at that time.”<sup>221</sup>

## 2. Date of the Hypothetical Negotiation

96. According to the Federal Circuit, the date of a hypothetical negotiation is the date at which infringement of a valid and enforceable patent first occurred.<sup>222</sup> This often has been interpreted to be the point of the first commercial sale, which makes sound economic sense, as this is typically the first point at which both parties – the patent owner and the accused infringer – recognize the need for a license negotiation.
97. In this matter, Seagate had been selling Accused Products – *i.e.*, HDDs that allegedly embody the technology covered by the ‘988 Patent – prior to the date on which the ‘988 Patent was issued in October 2006. Ms. Lawton and I agree that the date of the hypothetical negotiation, therefore, would have been in October 2006.<sup>223</sup>

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<sup>219</sup> *TWM Manufacturing Co., Inc. v. Dura Corp. and Kidde, Inc.*, 789 F.2d 895, 900 (Fed. Cir. 1986); John C. Jarosz and Michael J. Chapman, “The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog,” 16 *Stanford Technology Law Review* 769 (Spring 2013).

<sup>220</sup> *Fromson v. Western Litho Plate and Supply Co.*, 853 F.2d 1568, 1575 (Fed. Cir. 1988) (“Experience is then available to correct uncertain prophecy. Here is a book of wisdom that courts may not neglect. We find no rule of law that sets a clasp upon its pages, and forbids us to look within.”).

<sup>221</sup> Bryan W. Butler, “Patent Infringement: Compensation and Damages,” *Law Journal Press* (2009), at §4.02.

<sup>222</sup> *See Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858 (Fed. Cir. 1993).

<sup>223</sup> Lawton Report, ¶ 1057.

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98. I understand that, under 35 U.S.C. 286, LMS may not claim damages on sales of Accused Products before April 29, 2010, six years prior to the filing of the Complaint here. Therefore, Ms. Lawton and I also agree that, although the hypothetical negotiation would have occurred in October 2006, the appropriate damages period would not begin until April 29, 2010, at the earliest.
99. I understand that Seagate contends that LMS failed to comply with the marking requirements of 35 U.S.C. 287, and because of this, LMS cannot claim any pre-suit damages; in which case, the damages period would not begin until April 29, 2016.

**3. Parties to the Negotiation**

100. The parties to the hypothetical negotiation would have been the patent holder at the time of first alleged infringement and the alleged infringer. In October 2006, LS was the owner of the '988 Patent and Seagate was the alleged infringer.<sup>224</sup> Ms. Lawton and I agree that the hypothetical negotiation would have occurred between LS and Seagate.<sup>225</sup>

**IV. LAWTON REPORT**

**A. Overview**

101. In her report, Ms. Lawton purported to evaluate the form of royalties that typically result from patent license agreements to which Seagate has been a part, as well as from other patent license agreements in the HDD industry.<sup>226</sup> Based on her evaluation, Ms. Lawton concluded that a hypothetical negotiation between LS and Seagate in 2006 would have resulted in a license agreement for the '988 Patent that would be based on running royalty payments for each accused HGA sold by Seagate.<sup>227</sup>

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<sup>224</sup> U.S. Patent No. 7,128,988.

<sup>225</sup> Lawton Report, ¶ 1058.

<sup>226</sup> Lawton Report, ¶ 1084.

<sup>227</sup> Lawton Report, ¶¶ 1054, 1174.

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102. Ms. Lawton identified a set of licenses that she claimed are “comparable” to the license that would have resulted from the hypothetical negotiation covering the ‘988 Patent, and developed a range of value estimates for the ‘988 Patent amounting to \$0.30 to \$0.40 per HGA sold by Seagate during the period April 29, 2010 to December 31, 2017.<sup>228</sup> She ultimately concluded that a running royalty payment of \$0.30 per HGA would have prevailed from the hypothetical negotiation.<sup>229</sup>
103. Ms. Lawton offered various estimates of the base of HGA sales for which Seagate should pay a running royalty. Although Ms. Lawton did not appear to sponsor any of the royalty bases that she offered, she calculated the reasonable royalty damages to LMS corresponding with each of the royalty base estimates that she presented using the per-unit royalty of \$0.30. The corresponding damages amounts range from \$315.1 million to \$1.382 billion.<sup>230</sup>
104. Ms. Lawton’s analyses and conclusions are flawed. I discuss many of these flaws below.

**B. Form of Hypothetical License**

105. In support of her conclusion that the hypothetical negotiation would have resulted in a per-unit running royalty payment, Ms. Lawton cited several pieces of evidence:
- (1) the license agreements considered by the Tax Court in *Seagate Tech., Inc. v. Commissioner*;
  - (2) Seagate’s transfer pricing practices;
  - (3) Seagate and other read head technology licenses;
  - (4) Seagate’s licensing policies; and
  - (5) plaintiffs’ damages claims in other litigations.<sup>231</sup>

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<sup>228</sup> Lawton Report, ¶ 1008.

<sup>229</sup> Lawton Report, ¶ 1174.

<sup>230</sup> Lawton Report, Schedule A.1.

<sup>231</sup> In her report, Ms. Lawton also cited to a July 1998 license agreement between Carnegie Mellon University (“CMU”) and Showa Denko KK covering U.S. Patent No. 5,693,426 as an example of an agreement that

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**1. License Agreements in *Seagate v. Commissioner***

106. In *Seagate v. Commissioner* (1994), the U.S. Tax Court considered, among other things, whether the terms of a transfer-pricing and royalty agreement between two Seagate subsidiaries, Seagate Scotts Valley and Seagate Singapore, constituted arm's-length transactions.<sup>232</sup> According to the Court, prior to the formation of Seagate Singapore, all of Seagate Scotts Valley's manufacturing activities were conducted in its California facilities.<sup>233</sup> Starting in 1983, Seagate Scotts Valley transferred its disk-drive manufacturing operations to Singapore to "remain competitive in the disk drive market by reducing product costs and [to] help it capture a share of the growing market for disk drives in East Asia."<sup>234</sup> Under a royalty agreement, Seagate Scotts Valley granted Seagate Singapore non-exclusive rights (a) to use "Disc Drive Technology," defined as technology, know-how, and enhancements needed to manufacture three HDD models, ST412, ST212, and ST225; (b) to use and/or sell the products resulting from the Disc Drive Technology; and (c) to use the know-how relating to the Disc Drive Technology.<sup>235</sup> The Court explained that the agreement included the transfer of "certain valuable marketing intangibles as well as manufacturing intangibles to Seagate Singapore."<sup>236</sup> Pursuant to the original terms of the license agreement, Seagate Singapore made royalty payments to Seagate Scotts Valley

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resulted in a running-royalty license payment in the HDD industry. Lawton Report, ¶ 454. As support for her characterization of the CMU-Showa Denko license, Ms. Lawton cited to her own trial testimony in *Carnegie Mellon University v. Marvell Technology Group, Ltd, et al.* In her testimony, she did not provide any information regarding the terms of the license agreement. Moreover, LMS has not produced the license agreement in this litigation. If allowed, I will assess the relevance and comparability of that license agreement should it be provided to me.

<sup>232</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 156 (1994).

<sup>233</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 160 (1994).

<sup>234</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 160 (1994).

<sup>235</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 159 (1994).

<sup>236</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 281 (1994).

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at the rate of 1 percent of the sales price on certain sales of disk drives.<sup>237</sup>

107. As part of its assessment, the Court reviewed 15 third-party license agreements.<sup>238</sup> Ms. Lawton claimed that five of the 15 third-party license agreements reviewed by the Court included a per-unit running royalty and four agreements included a running royalty as a percentage of sales.<sup>239</sup> Ms. Lawton wrote that “[d]uring that proceeding, no party claimed that the payment structure for an arm’s length technology license in the HDD industry would be a lump sum.”<sup>240</sup> This led Ms. Lawton to conclude that HDD industry licenses from that proceeding support the conclusion that the hypothetical negotiation for a license to the ‘988 Patent would have resulted in a running royalty payment.<sup>241</sup>
108. Ms. Lawton apparently failed to appreciate that each of the nine agreements was a *product license, not a patent license*.

- The Seagate-Honeywell Bull agreement dated October 24, 1980 covered a one-way license that granted Honeywell Bull the non-exclusive right to manufacture and sell Seagate’s ST506 disc drives and other products throughout the world, except for North America and Japan.<sup>242</sup> As part of the agreement, Seagate agreed to provide training to Honeywell Bull’s personnel in the manufacture, assembly, and testing of the ST506 HDD.<sup>243</sup>
- The Company L-Seagate agreement dated December 1982 was a cross-license agreement that granted Seagate Scotts Valley the non-exclusive right to manufacture,

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<sup>237</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 245 (1994).

<sup>238</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, Section 5 (1994). *See also*, Lawton Report, ¶ 456.

<sup>239</sup> Lawton Report, ¶ 456.

<sup>240</sup> Lawton Report, ¶ 454.

<sup>241</sup> Lawton Report, ¶ 456.

<sup>242</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 251 (1994).

<sup>243</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 251 (1994).

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- use, and sell certain floppy disk drives compatible with the floppy disk drive system for which Company L had developed the design and manufacture technical specifications.<sup>244</sup> Company L also agreed to provide consultation to Seagate relating to the transfer of technology. Seagate agreed to give Company L a non-exclusive license under any of Seagate's patents or patent applications covering any modifications or improvements relating to the drives covered in Company L's license to Seagate.<sup>245</sup>
- The Seagate-Company N agreement dated April 1987 was a one-way license that granted Company N the exclusive right to manufacture and sell Seagate's ST225 disk drives in Brazil, and the non-exclusive right to manufacture and sell those disk drives in certain other countries in South America. Seagate also agreed to provide, at no charge, comprehensive training of Company N's personnel.<sup>246</sup> Company N agreed to purchase from Seagate products such as subassemblies at prices set in the agreement.<sup>247</sup>
  - The Company D-Company E agreement dated April 1985 was a one-way, exclusive license granted to Company E to manufacture and sell Company D's 25- and 38-megabyte drives in South Korea and to incorporate them into computer systems to be sold to third parties around the world. Company E also agreed to purchase material component kits from Company D until Company E obtained local sources for material components, and Company D agreed to purchase a specified number of disk drives from Company E between 1985 and 1987.<sup>248</sup>
  - The Company G-Companies H and J agreement of July 1987 granted a one-way license

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<sup>244</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 252-53 (1994).

<sup>245</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 253 (1994).

<sup>246</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 253-54 (1994).

<sup>247</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 254 (1994).

<sup>248</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 259 (1994).



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- to manufacture and sell Company G's computer peripheral subsystems in the Far East, Southeast Asia, Australia, and New Zealand, or directly to Company G. Company G further agreed to provide training to employees of Companies H and J. Company G also agreed to purchase a specified minimum quantity of products manufactured under the license agreement from Companies H and J. In a separate document, Company J agreed to purchase from Company G convertible preferred stock at a specified price.<sup>249</sup>
- The Seagate-TEAC Corp. agreement of February 1982 was a one-way license that granted TEAC the exclusive right to manufacture and sell Seagate's ST506 and ST412 disk drives in Japan and certain other Asian countries, as well as the non-exclusive right to manufacture and sell those drives throughout the world except for North America and most of Western Europe and the right to use Seagate's applicable trademarks and tradenames. Seagate agreed to provide comprehensive training to TEAC's employees at no charge.<sup>250</sup>
  - The Company B-Company C agreement of February 1984 was a one-way license that granted Company C a non-exclusive license to manufacture, use, and sell throughout the world all 5.25-inch half-height Winchester technology-based disk drives that Company B announced over a two-year period, and all improved versions produced over a five-year period. Companies B and C further agreed to cooperate to reduce the costs of raw materials, manufacturing facilities, maintenance, and other items important to the disk drive manufacturing process.<sup>251</sup>
  - The LaPine Technology Corp ("LTC")-Kyocera Corp agreement of October 1985 was

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<sup>249</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 260 (1994).

<sup>250</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 251-52 (1994).

<sup>251</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 254-55 (1994).

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- a one-way license that granted Kyocera the exclusive right to manufacture 3.5-inch disk drives and parts using LTC's technology, and sell those products directly or indirectly to LTC. Kyocera agreed to sell products or parts manufactured using LTC's technology only to LTC. Furthermore, at LTC's discretion, Kyocera could repurchase disk drives from LTC for resale to Kyocera's customers, with Kyocera paying LTC certain commission for such sales.<sup>252</sup>
- The Company B-Company F agreement dated March 1985 pertained to a one-way, exclusive license that granted Company F the right to manufacture Company B's 13-, 26-, and 40-megabyte half-height disk drives in the Far East, and the non-exclusive right to manufacture, use, and sell such disk drives throughout the world.<sup>253</sup>
109. Unlike the license in the hypothetical negotiation that would have granted Seagate a non-exclusive, naked license to a single (the '988) patent, each of the nine agreements assessed by the U.S. Tax Court that Ms. Lawton cited as evidence of the use of running royalties in the HDD industry covered entire products or components of products. In many cases – *i.e.*, the Seagate-Honeywell Bull license; the Seagate-Company N license; the Company D-Company E license; the Company G-Company H and J license; the Seagate-TEAC Corp. license; the Company B-Company C license; and the Company B-Company F license – the licensee acted as the patentee's agent by manufacturing and selling its products in other parts of the world.
110. Product licenses involve obtaining permission from a company (licensor) to manufacture and sell one or more of its products within a defined area. The company that obtains these

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<sup>252</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 257-58 (1994).

<sup>253</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 258 (1994).

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rights (the licensee) usually agrees to pay a running royalty fee to the original owner.<sup>254</sup>

111. Patent licenses, on the other hand, permit the licensee to lawfully conduct activities which would otherwise be within the patent holder's exclusive right.<sup>255</sup> Whereas some patent licenses ("patent-only licenses") grant only the right to conduct an activity defined within a patent (or series of patents), some patent licenses include access to additional information (e.g., trade secret know-how, designs, data, and schematics) that provide the licensee with, for example, the ability to develop or commercialize a product that embodies a patented technology.<sup>256</sup>
112. The academic literature has found that the form of the royalty paid in exchange for a license depends on the degree of "knowledge codification."<sup>257</sup> For example, royalty payments for licenses that include product plans, development and test data, and commercial and marketing data are relatively more likely to be structured as running royalties, whereas royalties for naked patent rights are relatively more likely to be structured as lump-sum payments.<sup>258</sup>

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<sup>254</sup> See., e.g., Bessy, Christian, et al., "Payment Schemes in Technology Licensing Agreements: A Transaction Cost Approach," April 31, 2008, available at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.416.5989&rep=rep1&type=pdf>; Brousseau, Eric, et al., "The Diversity of Technology Licensing Agreements and Their Causes," *les Nouvelles*, December 2005, at 179-200; Mach-Stadler, Ines, et al., "The Role of Information in Licensing Contract Design," *Research Policy*, 25 (1996), at 43-57; and <http://www.infoentrepreneurs.org/en/product-licensing/> (accessed July 10, 2018).

<sup>255</sup> <https://www.gpo.gov/fdsys/pkg/USCODE-2011-title35/html/USCODE-2011-title35-partIII-chap28-sec271.htm> (accessed July 11, 2018).

<sup>256</sup> <http://www.ip4inno.eu/index.php?id=184&L=1> (accessed July 11, 2018).

<sup>257</sup> See., e.g., Bessy, Christian, et al., "Payment Schemes in Technology Licensing Agreements: A Transaction Cost Approach," April 31, 2008, available at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.416.5989&rep=rep1&type=pdf>; Brousseau, Eric, et al., "The Diversity of Technology Licensing Agreements and Their Causes," *les Nouvelles*, December 2005, at 179-200; Mach-Stadler, Ines, et al., "The Role of Information in Licensing Contract Design," *Research Policy*, 25 (1996), at 43-57; and <http://www.infoentrepreneurs.org/en/product-licensing/> (accessed July 10, 2018).

<sup>258</sup> See., e.g., Bessy, Christian, et al., "Payment Schemes in Technology Licensing Agreements: A Transaction Cost Approach," April 31, 2008, available at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.416.5989&rep=rep1&type=pdf>; Brousseau, Eric, et al., "The Diversity of Technology Licensing Agreements and Their Causes," *les Nouvelles*, December 2005, at 179-200; Mach-Stadler, Ines, et al., "The Role of Information in Licensing Contract Design," *Research Policy*,

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113. Many product licenses, and specifically those examined by the U.S. Tax Court in *Seagate v. Commissioner*, also cover an on-going partnership and collaboration between the licensor and licensee. The licensors thereby agree to provide ongoing and future contributions, which is not envisioned in a hypothetical damages “license.”
114. As discussed above, in the Seagate-Honeywell Bull agreement, Seagate agreed to provide training to Honeywell Bull’s personnel in the manufacture, assembly, and testing of the ST506 HDD.<sup>259</sup> In the Company L-Seagate agreement, Company L agreed to provide consultation to Seagate relating to the transfer of technology.<sup>260</sup> In the Seagate-Company N agreement, Seagate agreed to provide comprehensive training of Company N’s personnel.<sup>261</sup> In the Company D-Company E agreement, Company E agreed to purchase material component kits from Company D.<sup>262</sup> In the Company G-Companies H and J agreement, Company G agreed to provide training to employees of Companies H and J.<sup>263</sup> And in the Company B-Company C agreement, Companies B and C agreed to cooperate to reduce the costs of raw materials, manufacturing facilities, maintenance, and other items important to the disk drive manufacturing process.<sup>264</sup> In short, on-going relationships were and are established, not one-time transfers of IP rights.
115. If one is interested in examining whether the hypothetical license would have resulted in a lump sum royalty or a running royalty, one should assess the form of the royalty that is common in other agreements that are similar to the hypothetical license. Because of the substantial differences between product licenses and patent licenses, product licenses are

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25 (1996), at 43-57; and <http://www.infoentrepreneurs.org/en/product-licensing/> (accessed July 10, 2018).

<sup>259</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 251 (1994).

<sup>260</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 253 (1994).

<sup>261</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 254 (1994).

<sup>262</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 259 (1994).

<sup>263</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 260 (1994).

<sup>264</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 254-55 (1994).

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not similar enough to provide reliable information about the form of the royalty in the hypothetical license. The fact that *product* licenses in the HDD industry involve a running royalty does not provide reliable evidence that a *patent* license in the HDD industry would result in a running royalty. This is confirmed by looking at actual *patent* licenses in the HDD industry.

116. Two of the 15 agreements assessed by the U.S. Tax Court, neither of which were relied upon by Ms. Lawton for her assessment of the form of the hypothetical license here, were patent licenses. Both included Seagate as a party and both contained lump-sum royalty payments only.

- The IBM-Seagate agreement of May 1984 was a cross-license that granted the parties non-exclusive rights to patents covering Seagate's Winchester disk drive technology and IBM's computer system technologies.<sup>265</sup>
- The Company M-Seagate agreement of September 1983 was a one-way license that granted Seagate the non-exclusive right to use Company M's technical data and patents in the manufacture of certain subassemblies.<sup>266</sup>

117. The license evidence from the *Seagate v. Commissioner* (1994) matter does not suggest that a running royalty form of license is appropriate here.

## 2. Seagate's Transfer Pricing Practices

118. Ms. Lawton pointed to Seagate's purported transfer pricing practices described in *Seagate v. Commissioner* (1994) as evidence that the hypothetical negotiation would have resulted in a running royalty payment.

119. According to the U.S. Tax Court, beginning in 1982, Seagate Scotts Valley formed and

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<sup>265</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 253 (1994).

<sup>266</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 253 (1994).

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shifted the manufacturing processes of certain component parts for disk drives – such as E-blocks, printed circuit boards (“PCBs”), and HGAs – and completed disk drives to Seagate Singapore.<sup>267</sup> Seagate Singapore began selling component parts and completed disk drives to Seagate Scotts Valley, for which Seagate Scotts Valley would pay Seagate Singapore a transfer price based on the standard cost of manufacturing the component part or disk drive.<sup>268</sup> Under one of its transfer price agreements, for example, Seagate Scotts Valley paid the standard cost of manufacturing the component part or disk drive in Singapore plus 25 percent of those costs.<sup>269</sup>

120. However, unlike the patent license that would have resulted from the hypothetical negotiation, the transfer pricing agreement between Seagate Scotts Valley and Seagate Singapore was not a license agreement associated with a patent. Rather, it was a manufacturing agreement in which one affiliated party would manufacture and supply certain component products or completed disk drives to the other.
121. Intra-company transfer transactions covering tangible assets, such as component products, are typically governed by agreements that establish transfer prices which reflect the prices that would be paid for those components had the transaction taken place at arm’s length between unrelated parties.<sup>270</sup> Arm’s length prices for component products are typically paid on a per-unit basis, as they would be under an agreement between unrelated parties, and are often based on a cost-plus basis to provide the supplying entity with an arm’s-length profit margin on its sales.<sup>271</sup>

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<sup>267</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 172-73 (1994).

<sup>268</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 172 (1994).

<sup>269</sup> *Seagate Tech., Inc. v. Commissioner*, 102 T.C. 149, 173 (1994).

<sup>270</sup> <https://www.pwc.com/gx/en/international-transfer-pricing/assets/itp-2013-final.pdf>, at 18 (accessed July 11, 2018).

<sup>271</sup> <https://www.pwc.com/gx/en/international-transfer-pricing/assets/itp-2013-final.pdf>, at 62 (accessed July 11, 2018).

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122. The transfer pricing practice evidence from the *Seagate v. Commissioner* (1994) matter does not suggest that a running royalty form of license is appropriate for the hypothetical patent license here.

### **3. Read-Head Technology Licenses**

123. According to Ms. Lawton, “Seagate’s perspective at the time of the hypothetical negotiation would be informed by its prior licensing of HDD recording head technology.”<sup>272</sup> She posited that “Seagate, as well as others in the HDD industry, have agreed to pay both running royalties and lump sums for certain *read* head technology.”<sup>273</sup> In her analysis, Ms. Lawton analyzed six agreements that she wrote covered read head technology, three of which called for running royalty payments and three of which called for lump-sum license fees.<sup>274</sup>
124. The three agreements cited by Ms. Lawton that contained running royalty rates were (1) the May 19, 1995 cross-license and know-how transfer agreement between Headway and Seagate; (2) the April 24, 1998 extension of the Headway-Seagate agreement; and (3) an August 12, 1996 agreement between Censtor and Western Digital.<sup>275</sup>
125. The 1995 and 1998 agreements between Headway and Seagate are cross-licenses to certain of each company’s respective technology rights “for the purpose of development and determining the compatibility between Seagate and Headway of the potential manufacture and distribution of MR Heads utilizing Headway Dual Stripe MR Technology.”<sup>276</sup> The part of the agreement that provided for a running royalty pertained only to the transfer of all

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<sup>272</sup> Lawton Report, ¶ 638.

<sup>273</sup> Lawton Report, ¶ 638.

<sup>274</sup> Lawton Report, ¶ 639, Table 7.1.

<sup>275</sup> Lawton Report, ¶ 639, Table 7.1.

<sup>276</sup> LAMBETH-000262599 – 3084, at LAMBETH-000262818.

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technology and know-how necessary for Seagate to develop, fabricate, and/or manufacture Headway's Dual Stripe MR heads, "including but not limited to schematics, flow charts, test methods, purchase specifications, engineering specifications, computer programs, technical data, software and log books."<sup>277</sup> This was a patent license.

126. The 1996 agreement between Censtor and Western Digital granted a portfolio of rights to Western Digital and its affiliated entities, including, (1) all Censtor patents worldwide (which included approximately 17 issued U.S. patents, 14 pending U.S. patent applications, 10 foreign patents, and an unknown number of foreign applications); (2) all patents licensed by Censtor from third-parties, including Denka, that Censtor is allowed to sublicense without cost; and (3) Censtor's trademarks.<sup>278</sup> In addition, the license granted Western Digital and its affiliated entities the ability to purchase heads, HGAs, and HSAs covered by the license patents from CRT.<sup>279</sup> The license agreement did not distinguish between the portion of royalties paid that are allocable to the licensed patents as opposed to the included trademarks or the ability to purchase component parts from CRT at an unspecified cost. The significance of the supply authorization of the license agreement is

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<sup>277</sup> LAMBETH-000262599-3084, at LAMBETH-000262832.

<sup>278</sup> LAMBETH-000276218-289, at LAMBETH-000276220, 55-57. Ms. Lawton did not include the trademark rights in her summary of the Censtor-Western Digital license agreement. Lawton Report, ¶ 639.

<sup>279</sup> As discussed in greater detail below, prior to entering into this license, Censtor modified its business strategy to concentrate on licensing rather than licensing and manufacturing. In conjunction with this shift in strategy, Censtor agreed to sell its manufacturing and R&D operations to Read-Rite in July 1996, while also granting Read-Rite a non-exclusive license to Censtor's patents. LAMBETH-000276829-908, at LAMBETH-000276852. It is not clear whether CRT was included in the sale to Read-Rite. The license agreement with Western Digital provides that Censtor will authorize CRT to manufacture and sell heads and other components to Western Digital. LAMBETH-000276218-89, at LAMBETH-000276258. However, it also provides that "no royalties shall accrue or be payable in respect of Royalty Bearing Products which contain heads purchased by Licensee or one or more of its Affiliated Entities (or their designated assembly vendor) from CRT and provided further that no royalties shall accrue or be payable in respect of Royalty Bearing Products on account of the inclusion therein of components procured by Licensee or one or more of its Affiliated Entities (or their designated assembly vendor) from Read-Rite Corporation, its successors and assigns ("RRC") to the extent Censtor has licensed RRC to manufacture, have manufactured, import, use and sell such components." LAMBETH-000276218-89, at LAMBETH-000276220, 58-59.



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evident, however, from the provisions providing that no royalties are due on products that contain heads purchased from CRT or that contain components procured from Read-Rite.<sup>280</sup> As well, the prescribed royalty rates payable on sales of covered products were subject to aggregate royalty caps, and the maximum royalty payable could be reduced, or dropped to zero, under certain conditions (including the purchase of a specific number of heads from CRT). Thus, the structure of the license agreement is consistent with a product supply agreement, in which patent rights are granted on products purchased from the licensor.<sup>281</sup>

127. Similar to the agreements assessed by the U.S. Tax Court that were cited by Ms. Lawton in support of her position regarding the royalty form, the read head technology agreements to which she cited that contained a running royalty covered entire products or components of products. Unlike the hypothetical license, these agreements covered an ongoing, collaborative relationship between the parties. This situation is quite different from a patent-only license. Product licenses are different than patent licenses. These differences are underscored by the fact that, while product licenses in this industry may involve running royalties, patent licenses generally include lump sum royalties only.
128. In fact, the three agreements covering read head technology cited by Ms. Lawton that included an upfront, lump-sum payment were patent-only licenses.
  - The February 1995 cross-license agreement between Headway and Seagate granted a

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<sup>280</sup> Read-Rite acquired the manufacturing aspects of Censtor's business in July 1996. LAMBETH-000276218-89, at LAMBETH-000276220, 59.

<sup>281</sup> In addition, Censtor's 1996 10-K/A indicates that Censtor had licenses with nine HDD and HDD component manufacturers, but to date "no products utilizing the Company's technology have been introduced and there can be no assurance that such products will ever be introduced or marketed." LAMBETH-000276218-89, at LAMBETH-000276220.

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“worldwide, fully paid-up, non-exclusive, non-transferable, irrevocable, royalty-free license” to the licensed patents.<sup>282</sup>

- The July 24, 1997 agreement between the Jülich Institute and Seagate provided a one-way, non-exclusive, worldwide license to one U.S. patent and 3 foreign counterparts. As described in greater detail below, the patented technologies covered by this license were widely seen to be ground-breaking technologies in the HDD industry for which the inventors received a Nobel Prize. In return for the license to these patents, Seagate paid a lump-sum fee totaling \$1.2 million.<sup>283</sup>
- The March 7, 2002 agreement between Censtor and Seagate granted Seagate a worldwide, non-exclusive, perpetual license to all of Censtor's patents and applications filed or granted before or after the effective date. In return, Seagate agreed to pay Censtor a lump-sum amount of \$2 million.<sup>284</sup>

129. The read head technology licenses do not suggest that a running royalty form of license is appropriate here.

**4. Seagate's Licensing Policies and Practices**

130. Ms. Lawton repeatedly cited testimony from Mr. Robert Pechman, Seagate's Chief Intellectual Property Counsel, in which he stated that “Seagate does not have policies concerning licensing specifically,” and that it does not have a policy against paying a running royalty for licenses.<sup>285</sup> This appeared to have led Ms. Lawton to conclude that Seagate would have been willing to pay running royalties for a license to the ‘988 Patent.

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<sup>282</sup> SEA00527065-77, at SEA00527065, 68.

<sup>283</sup> SEA00183921-27, at SEA00183921, 23, 24, 27.

<sup>284</sup> SEA00183901-12, at SEA00183901-02.

<sup>285</sup> Deposition of Robert J. Pechman, February 8, 2018 (“Pechman Deposition”), at 92.

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However, Ms. Lawton appears to have ignored other testimony from Mr. Pechman.

131. [REDACTED]  
[REDACTED]  
[REDACTED].<sup>287</sup> This is confirmed by an assessment of the 65 agreements produced by Seagate in this matter. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED] [REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

██████<sup>293</sup> In this case, it would be particularly difficult and potentially impossible to determine the correct base of sales to which the license agreement for the ‘988 Patent would

<sup>286</sup> Pechman Deposition, at 94.

<sup>287</sup> Pechman Deposition, at 93-94.

288 Tab 6.

289 Tab 7.

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291 Tab 7.

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Tab 7.

293 Pechman Deposition, at 121-122.

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have applied. [REDACTED]

[REDACTED] Indeed, as I describe further below, to estimate the royalty base(s) to which she believes a running royalty would have applied, Ms. Lawton had to make numerous assumptions.<sup>295</sup>

133. Ms. Lawton's conclusion that [REDACTED]

**5. Plaintiffs' Damages Claims in Other Litigations**

134. As further purported support for her conclusion that the payment resulting from the hypothetical license would have been structured as a running royalty, Ms. Lawton cited to plaintiffs' damages *claims* in four litigation cases.<sup>296</sup>

135. Damages *claims* do not provide a reliable basis to determine what would have resulted from the hypothetical negotiation. One could just as easily cite to the defendants' claims in support of a very different outcome.

136. Ms. Lawton's reliance on damages claims from litigation cases as evidence of the form of the payment that would have resulted in this case is further undermined by the fact that the

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<sup>294</sup> Shay Deposition, at 154.

<sup>295</sup> Lawton Report, ¶¶ 1023-27.

<sup>296</sup> Lawton Report, ¶¶ 454(c), 454(d), 454(e), 454(f).

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outcome of those cases often did not result in running royalty payments, despite plaintiffs' claims suggesting that a running royalty was appropriate. In *Convolve v. Dell*, for example, Convolve's expert claimed that the appropriate royalty rate was a running rate of \$1 per unit.<sup>297</sup> The jury, however, disagreed with the plaintiff's damages claims and found that the royalty payment in that case should have been structured as a lump-sum.<sup>298</sup> Moreover, Convolve's expert acknowledged at trial that Convolve had offered its entire patent portfolio (and not just the patent at issue in that litigation) to IBM in exchange for a fully-paid up, lump-sum royalty of \$2.4 million, which was the equivalent of \$0.02 per drive,<sup>299</sup> and to Seagate in exchange for a fully-paid, lump-sum royalty of \$1.4 million,<sup>300</sup> among other companies.<sup>301</sup>

137. Similarly, in *Convolve v. Seagate*, Convolve's expert again claimed that the appropriate royalty rate was a running rate of \$1 per unit.<sup>302</sup> I understand that the SDNY twice ruled that no infringement had occurred, and thus no royalty was due.<sup>303</sup> The claimed royalty

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<sup>297</sup> *Convolve, Inc. v. Dell, Inc., et al.*, Civil Docket No. 2:08-CV-244 (E.D. Tex.), Dkt. 552 (Trial Transcript, July 20, 2011 (Trial Day 4) – Bruce McFarlane, Direct), 44:18-44:22 (“A. ... I concluded that the royalty rate that would result from the hypothetical negotiation that was adequate to compensate Convolve for the Defendants’ alleged use of the ’473 patent would be \$1 per unit.”).

<sup>298</sup> *Convolve, Inc. v. Dell, Inc., et al.*, Civil Docket No. 2:08-CV-244 (E.D. Tex.), Dkt. 523 (Jury Verdict Form).

<sup>299</sup> *Convolve, Inc. v. Dell, Inc., et al.*, Civil Docket No. 2:08-CV-244 (E.D. Tex.), Dkt. 552 (Trial Transcript, July 20, 2011 (Trial Day 4) – Bruce McFarlane, Direct), 59:3-60:13, 60:21-61:12, 63:5-18 (“Q. So on our chart when we’re talking about types of royalties that Convolve was willing to accept, you can agree that was a lump sum. A. That was a lump-sum offer, yes.”...“Q. Thank you. And what we also know is that the amount that Convolve was willing to accept was \$2.4 million, true? A. True.”...“Q. So what they did is, they took the 2.4-million-dollar lump sum, and they come up with what Convolve was offering -- not that IBM accepted, but Convolve was offering, 2 cents per drive, correct? A. That’s what that math shows, yes.”)

<sup>300</sup> *Convolve, Inc. v. Dell, Inc., et al.*, Civil Docket No. 2:08-CV-244 (E.D. Tex.), Dkt. 552 (Trial Transcript, July 20, 2011 (Trial Day 4) – Bruce McFarlane, Direct), 70:6-71:22.

<sup>301</sup> *Convolve, Inc. v. Dell, Inc., et al.*, Civil Docket No. 2:08-CV-244 (E.D. Tex.), Dkt. 552 (Trial Transcript, July 20, 2011 (Trial Day 4) – Bruce McFarlane, Direct), 73:7-74:5.

<sup>302</sup> *Convolve, Inc. and Massachusetts Institute of Technology v. Compaq Computer Corp. and Seagate Technology, LLC*, Civil Docket No. 1:00-cv-05141-GBD-JCF (S.D. N.Y.), Dkt. 1062-4 (Fourth Supplemental Expert Report of Michael J. Wagner dated August 15, 2011, Schedule 1s, Schedule 3.2, Schedule 5.2, showing that claimed royalties on the ’473 patent on Schedule 1s, row c are equivalent to the number of units shown on Schedules 3.2 and 5.2).

<sup>303</sup> I understand further that the case has been appealed twice and subsequently remanded twice, and is currently

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rate was the same running royalty rate on the same patent that the jury in *Convolve v. Dell* rejected in favor of a lump sum royalty.<sup>304</sup>

## 6. Summary

138. Ms. Lawton's conclusion that a hypothetical negotiation here should have resulted in a running royalty payment is unfounded. Most of the agreements she cited are product licenses, not patent licenses. Similarly, Seagate's transfer-pricing practices covered a manufacturing agreement in which one affiliated party would manufacture and supply certain component products or completed disk drives to the other. In fact, available information from the sources of evidence cited by Ms. Lawton indicate [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

## C. Royalty Rate

139. In support of her conclusion that the hypothetical negotiation would have resulted in a royalty rate of \$0.30 per HGA, Ms. Lawton wrote that the claimed invention constitutes a "major breakthrough" that was very important and key enabling technology for PMR,"<sup>305</sup>

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before the SDNY for a third trial. However, I understand that no ruling has been issued as to infringement or royalties due to-date. *See, e.g.*, <http://www.patentdocs.org/2016/02/convolve-inc-v-compaq-computer-corp-fed-cir-2016.html>. (accessed July 11, 2018).

<sup>304</sup> In both cases, the patent at issue was the '473 patent. *Convolve, Inc. and Massachusetts Institute of Technology v. Compaq Computer Corp. and Seagate Technology, LLC*, Civil Docket No. 1:00-cv-05141-GBD-JCF (S.D. N.Y.), Dkt. 1062-4 (Fourth Supplemental Expert Report of Michael J. Wagner dated August 15, 2011, Schedule 1s, Schedule 3.2, Schedule 5.2); *Convolve, Inc. v. Dell, Inc., et al.*, Civil Docket No. 2:08-CV-244 (E.D. Tex.), Dkt. 523 (Jury Verdict Form).

<sup>305</sup> Lawton Report, ¶ 925(a).

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and a “bottleneck asset” as of the time of the hypothetical negotiation because it was ““one critical piece of technology [that if] absent, or not sufficiently well developed, the rest of the product (or system) would fail.””<sup>306</sup> She appears to have attributed much, if not all, of the benefits associated with PMR technology to the technology covered by the ‘988 Patent.<sup>307</sup> That is reflected in her discussion of the economic advantages of the claimed invention of the ‘988 Patent. Ms. Lawton wrote that there are four economic benefits associated with the switch from LMR to PMR: (1) “Cost Savings Attributable to Lower Component Count”; (2) “Cost Savings Attributable to Increased Yield”; (3) “Increased Revenue and Profits Attributable to an Expanded Market”; and (4) “Increased Revenue and Profits Attribute to Increased Market Share.”<sup>308</sup> She then used her estimates of Seagate’s cost savings and increased profit attributable to *all of* PMR as one basis for her valuation analysis for the ‘988 Patent alone.<sup>309</sup> In doing so, Ms. Lawton failed to adequately attribute value to the other parts of the write head, the slider (such as the other components of the write head, the read head, the heater, and the air bearing surface), the HGA (such as the gimbal, microactuators, and electronic components), and the media.<sup>310</sup>

140. Ms. Lawton identified a set of “benchmarks” that she claimed were relevant to her analysis, and developed a range of value estimates from those “benchmarks” of \$0.30 to \$0.40 per HGA sold by Seagate during the period April 29, 2010 to December 31, 2017.<sup>311</sup> She then assessed the *Georgia-Pacific* factors, and concluded that the amount of the running royalty

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<sup>306</sup> Lawton Report, ¶¶ 403, 925(b).

<sup>307</sup> In her report, Ms. Lawton included a discussion on “design-ins” and “design wins”. Lawton Report, ¶¶ 504-25. However, that discussion does not appear to pertain to the ‘988 Patent or contribute to her reasonable royalty analysis.

<sup>308</sup> Lawton Report, ¶¶ 162, 172-204.

<sup>309</sup> Lawton Report, ¶ 1008, Chart 9.2.

<sup>310</sup> Fullerton Report, ¶¶ 148-63.

<sup>311</sup> Lawton Report, ¶ 1008, Chart 9.2.

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that would have resulted from the hypothetical negotiation would be \$0.30 per HGA.<sup>312</sup>

141. Ms. Lawton improperly assessed the relative value of the '988 Patent, and used inappropriate "benchmarks."

**1. Footprint of the '988 Patent**

**a. HDD Value Drivers**

142. The GMR principle was discovered in the late 1980s by researchers at the University of Paris in France and at the Jülich Institute for Physics in Germany.<sup>313</sup> A patent on the use of this technology in HDDs was filed by the Jülich Institute in 1989.<sup>314</sup> The GMR technology was first commercialized by IBM in 1997, approximately ten years after its discovery.<sup>315</sup>
143. Dedrick and Kraemer (2015) examined how the benefits and value created by this GMR technology were distributed among the many contributors to its discovery and commercialization, including the scientists who discovered the technology, the companies who developed a workable product using this technology, the companies who commercialized the technology, and the countries in which each of the other participants were located.<sup>316</sup>
144. Albert Fert and Peter Grünberg pioneered the discovery of the GMR technology, but were not involved in later phases of development or commercialization, despite recognizing the

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<sup>312</sup> Lawton Report, ¶ 1174.

<sup>313</sup> Jason Dedrick and Kenneth L. Kraemer, "Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry," *Research Policy*, Vol. 44 (2015), 1615-28, at 1615, 16, 18.

<sup>314</sup> U.S. Patent No. 4,949,039.

<sup>315</sup> Jason Dedrick and Kenneth L. Kraemer, "Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry," *Research Policy*, Vol. 44 (2015), 1615-28, at 1616, 19.

<sup>316</sup> Jason Dedrick and Kenneth L. Kraemer, "Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry," *Research Policy*, Vol. 44 (2015), 1615-28, at 1619.



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commercial potential early on.<sup>317</sup> The two researchers and their affiliated laboratories and institutions benefited by receiving prestige and numerous awards (including the Nobel Prize in Physics, and 10 million SEK in associated prize money), as well as “small licensing fees.”<sup>318</sup> The countries in which the researchers and the companies that commercialized GMR were located earned benefits in the form of jobs and wages for commercial manufacturers, prestige, and industry leadership.

145. A large share of the resulting benefits and value accrued to the firm that developed a workable product using this technology (IBM), and those that subsequently commercialized such products. IBM generated an estimated \$4.2 billion in revenue during the first four years of commercialization (1999 to 2002), and gross profits of approximately 36 to 37 percent on these revenues.<sup>319</sup> As early as 1999, other hard disk drive manufacturers, such as Seagate, commercialized the GMR technology, resulting in industry gross profits of approximately \$8.1 billion between 1999 and 2006.<sup>320</sup> According to estimates cited by Ms. Lawton,<sup>321</sup> Seagate’s worldwide sales of HDDs incorporating GMR technology exceeded \$23.3 billion between August 2000 and March 2008.<sup>322</sup>

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<sup>317</sup> Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1618.

<sup>318</sup> Specifically, the authors wrote that one researcher, Peter Grünberg, earned approximately \$3 million in royalties from the GMR patent, and the Jülich Institute with which he was affiliated, earned €10 million in patent royalties from the GMR patent. Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1615, 20, 25.

<sup>319</sup> Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1620-21.

<sup>320</sup> Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1620-21.

<sup>321</sup> Lawton Report, ¶ 1034.

<sup>322</sup> Calculated as \$23.3 billion = \$12.1 billion + \$11.2 billion. In *Siemens AG v. Seagate*, Seagate’s direct U.S. sales of HDDs that incorporated “GMR sensor[s] with an AAF” amounted to \$12.1 billion between August 2000 and

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146. Dedrick and Kraemer (2015) noted and provided various explanations for why a much larger share of the benefits from the invention of GMR technology were captured by the companies that brought the technology to commercialization compared with the researchers who discovered (and first patented) the technology for use in HDDs.
147. Commercializing HDD technologies requires a “sustained effort in R&D.”<sup>323</sup> Moreover, critical is the “value of experience with related knowledge.”<sup>324</sup> That is, the ability to successfully commercialize technology, such as GMR, depended on existing knowledge and manufacturing capabilities developed from experience commercializing earlier, similar technologies, such as AMR.<sup>325</sup> That notwithstanding, the ability to profit from this type of technology was limited. The nature of this type of technology, and the firms seeking to commercialize it, is such that information about product and technology developments is widely available and easily exploited, limiting the ability of information owners to profit from it.<sup>326</sup> In addition, the commoditized nature of HDDs that utilize the GMR technology limited opportunities to differentiate products, develop branding, and create switching costs for consumers, which in turn drove down product costs and further limited the

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March 2008.” It was further estimated Seagate’s “additional sales to U.S. OEMs” amounted to \$11.2 billion during the same period. As these sales do not include sales outside the U.S. to non-U.S. OEMs, they are a subset of Seagate’s worldwide sales of HDDs incorporating GMR technology. *Siemens AG v. Seagate Technology, LLC*, Case No. 8:06-cv-00788-JVS-AN (C.D. Cal.), Dkt. 776 (Trial Transcript, December 4, 2008, 59:10-15; 65:12-19; and 72:1-8). *See also*, SEA03341834-35.

<sup>323</sup> Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1619.

<sup>324</sup> Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1624.

<sup>325</sup> Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1623-24.

<sup>326</sup> Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1624-25.

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potential profitability of products incorporating the GMR technology.<sup>327</sup> Thus, profits were captured mostly by the firms that were able to quickly develop and commercialize products – both the initial commercialized product and newer generations that built off of it – and not by those who developed the initial innovation.<sup>328</sup> Dedrick and Kraemer (2015) concluded that “[i]t is clear from this case that the economic benefits from scientific discovery may go to the companies and countries that commercialize technology rather than to the individuals, institutions and countries that make the scientific discovery.”<sup>329</sup>

148. The invention, development, and commercialization of GMR provides guidance here. PMR – while not invented, developed, or commercialized by Dr. Lambeth – has many marketplace similarities to GMR, such that successful commercialization, and thus successful value capture, is influenced greatly by past experience and related knowledge with similar technologies. That is, with GMR technology, most of the value was captured by the companies that had the design and product development skills to convert the initial innovation into a commercializable product at a greater speed and scale than other companies, and not by the innovators who initially developed the technology.<sup>330</sup> Knowledge moves freely and rapidly for technologies such as AMR, GMR, and PMR, so

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<sup>327</sup> Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1624-25.

<sup>328</sup> Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1624-25.

<sup>329</sup> Jason Dedrick and Kenneth L. Kraemer, “Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry,” *Research Policy*, Vol. 44 (2015), 1615-28, at 1625.

<sup>330</sup> This point was at the core of the research done and publicized by Dr. Teece, which Ms. Lawton cited 10 times in her report. David Teece, “Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing, and Public Policy,” *Research Policy*, Vol. 15 (1986), 285-305. Substantial returns accrue to contributors that add substantial value to the original innovative work, returns that often exceed the returns to the original innovator.

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the biggest factors that drive value capture are those related to the ability to move from innovation to commercialization.<sup>331</sup>

**b. '988 Patent Contribution**

149. I understand that the '988 Patent is directed to an "improvement of a single magnetic property via the crystal structure of 'a region of primary materials referred to as the "write pole,""<sup>332</sup> which is a subcomponent within the write head.<sup>333</sup> As described above, write heads are paired with read heads, which record and retrieve data on HDD disks, respectively,<sup>334</sup> and are subcomponents of the wafer level slider (or "head"). Wafer level sliders are subcomponents of HGAs, which are subcomponents of HSAs and comprise one of the six major subassemblies of an HDD.<sup>335</sup> In total, the major subassemblies contain hundreds of components and supplements.<sup>336</sup>
150. The hundreds of components to an HDD embody technologies that are covered by thousands of patents.<sup>337</sup> As cited by Ms. Lawton, as of 2003, "there were over 10,000 relevant patents in the disc drive industry."<sup>338</sup> As of June 27, 2003, Seagate, whose business is almost entirely HDDs, had approximately 2,087 U.S. patents and 723 foreign patents, as well as "approximately 1,383 U.S. and 1,561 foreign patent applications."<sup>339</sup> By June 30,

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<sup>331</sup> Jason Dedrick and Kenneth L. Kraemer, "Who Captures Value from Science-Based Innovation? The Distribution of Benefits from GMR in the Hard Disk Drive Industry," *Research Policy*, Vol. 44 (2015), 1615-28, at 1624-25.

<sup>332</sup> Fullerton Report, ¶¶ 186-96; Lawton Report, ¶124.

<sup>333</sup> Lawton Report, ¶124.

<sup>334</sup> The process of storing information involves major components such as an actuator, connections, logic board, disks, and spindle. Other parts involved in reading and writing data include a voice coil, ribbon, arms, and slider. See <https://general-animagraffs.netdna-ssl.com/wp-content/uploads/how-hard-disk-drives-work-1.png> (accessed June 9, 2018).

<sup>335</sup> Lawton Report, ¶213.

<sup>336</sup> *Siemens AG v. Seagate Technology, LLC*, Case No. 8:06-cv-00788-JVS-AN (C.D. Cal.), Dkt. 780 (Trial Transcript, November 21, 2008), 134:11-12.

<sup>337</sup> According to Ms. Lawton herself, "TDK noted that '[n]umerous technological breakthroughs in HDD head technology have made possible the amazingly high recording densities of today.'" Lawton Report, ¶291.

<sup>338</sup> Lawton Report, ¶431.

<sup>339</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 27, 2003, at 9.

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2017, Seagate's portfolio of issued patents increased substantially to approximately 5,600 U.S. patents and 1,300 foreign patents, as well as "approximately 1,100 U.S. and 900 foreign patent applications."<sup>340</sup> For HDD *head technology alone*, Seagate currently owns 1,528 U.S. Patents that were filed between 2000 and 2016.<sup>341</sup> Of these, 1,221 are issued and current, while an additional 307 patents have been abandoned, expired, lapsed, or were sold.<sup>342</sup>

151. [REDACTED]

152. I understand that the '988 Patent does not teach PMR technology, nor is it even essential to PMR technology; it is one way to slightly fine tune one class of materials that can be used in accomplishing PMR.<sup>345</sup> According to Dr. Fullerton, "Seagate independently developed PMR technology beginning in the 1990s, resulting in prototypes no later than

<sup>340</sup> Seagate Technology PLC SEC Form 10-K for the fiscal year ended June 30, 2017, at 9.

<sup>341</sup> SEA03336139.

<sup>342</sup> SEA03336139.

<sup>343</sup> Conversation with Matt Hadley, July 6, 2018 ("Conversation with Hadley"). *See also*, <https://www.linkedin.com/in/mattjhadley/> (accessed July 10, 2018).

<sup>344</sup> According to Mr. Hadley, to the extent the technology covered by the '988 Patent was practiced by Seagate, it would be [REDACTED]

<sup>345</sup> Conversation with Dr. Eric Fullerton, July 11, 2018 ("Conversation with Fullerton").

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2001—including those using FeCo in the write heads—well before the publication or issuance of the ‘988 Patent.”<sup>346</sup> He wrote that “the purported invention of the ‘988 Patent at most had an incremental effect in improving uniaxial anisotropy in write heads,” and “any such improvement would be *de minimis* at best, and uniaxial anisotropy could be derived from multiple other prior art sources, including from shape, pair ordering, and strain.”<sup>347</sup>

153. The ‘988 Patent does not solve issues associated with “erase after write” (or “EAW”), whereby data are unintentionally erased after being recorded on a disk.<sup>348</sup> In fact, many other technologies can be and have been used to address EAW.<sup>349</sup>

**c. DSSC Technology**

154. Seagate’s investment in and agreement with Carnegie Mellon University’s (“CMU’s”) Data Storage Systems Center (“DSSC”) presents a useful source of context regarding value creation in the HDD business.
155. According to CMU, the DSSC is “a world leading academic research institution in data storage technology” whose “research program focuses on magnetic data storage technology for hard disk drive application as well as emerging solid-state memory technologies.”<sup>350</sup> The DSSC partners with multiple HDD companies, including Western Digital, TDK, and Seagate.<sup>351</sup>
156. Since October 1, 1992 through at least September 30, 2017,<sup>352</sup> Seagate has had an

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<sup>346</sup> Fullerton Report, ¶ 873.

<sup>347</sup> Fullerton Report, ¶ 887.

<sup>348</sup> Conversation with Fullerton.

<sup>349</sup> Conversation with Fullerton.

<sup>350</sup> <https://www.dssc.ece.cmu.edu/> (accessed July 10, 2018).

<sup>351</sup> <https://www.dssc.ece.cmu.edu/> (accessed July 10, 2018).

<sup>352</sup> Deposition of Robert Wooldridge, February 15, 2018, (“Wooldridge Deposition”), at 62-63.



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agreement with the DSSC in which Seagate agreed to “contribut[e] to the financial support of the research activities, and receiv[e] certain benefits from such association.”<sup>353</sup> Specifically, Seagate agreed to make an annual payment of \$250,000 to fund the DSSC’s research activities.<sup>354</sup> In return, Seagate was granted a “worldwide, irrevocable, royalty-free license to make, have made, use, or sell the product” of “[a]ll inventions, whether or not patentable, conceived or first reduced to practice in the course of or under [the agreement] by any [DSSC] personnel while engaged in the activities of [the DSSC].”<sup>355</sup> The agreement also provided Seagate with, among other things, access to software developed at the DSSC and access to graduate students for cooperation and recruiting.<sup>356</sup>

157. As of October 2004, the DSSC had a portfolio of 22 U.S. patents that were covered by its license agreement with Seagate.<sup>357</sup> Included among its patent portfolio is U.S. Patent No. 6,248,416 (the “’416 Patent”), U.S. Patent No. 5,693,426 (the “’426 Patent”), and U.S. Patent No. 4,825,318 (the “’318 Patent”).<sup>358</sup> According to Dr. Fullerton, these patents relate to technologies that are technologically comparable to the invention claimed in the ‘988 Patent.<sup>359</sup> In fact, Dr. Fullerton wrote that “[t]he invention claimed by the ’426 Patent offers a significantly greater improvement than the invention claimed in the ‘988 Patent ... [because it] allowed a significant increase in coercivity of the media and smaller grain sizes, which in turn allowed for higher areal density ... [that was] adopted by the industry.”<sup>360</sup>

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<sup>353</sup> SEA02238164-70, at 65.

<sup>354</sup> SEA02238164-70, at 67.

<sup>355</sup> SEA02238164-70, at 65.

<sup>356</sup> SEA02238164-70, at 66.

<sup>357</sup> <https://www.dssc.ece.cmu.edu/research/patents.html> (accessed July 10, 2018).

<sup>358</sup> <https://www.dssc.ece.cmu.edu/research/patents.html> (accessed July 10, 2018).

<sup>359</sup> See, e.g., Fullerton Report, ¶¶ 898, 901, 904.

<sup>360</sup> Fullerton Report, ¶ 902.

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158. In her report, Ms. Lawton often cited to the '426 Patent, which she referred as the "nickel-aluminum patent."<sup>361</sup> According to Ms. Lawton, the patent covers "a method for layering materials on hard drives *that was used in virtually every laptop sold until 2003.*"<sup>362</sup> The National Science Foundation characterized the nickel-aluminum technology as "one of the many groundbreaking data storage innovations developed by the DSSC over the last 20 years."<sup>363</sup>
159. Seagate and other HDD manufacturers have, therefore, gained access to many "groundbreaking data storage innovations" through their agreements with the DSSC, for which Seagate has paid \$250,000 per year.<sup>364</sup> Among these are patents, such as the '416 Patent, the '426 Patent, and the '318 Patent, which are technologically comparable to or "offer[] a significantly greater improvement than the '988 Patent."<sup>365</sup>

**d. Hold Up**

160. In her report, Ms. Lawton repeatedly asserted that LMS would occupy a strong bargaining position at the hypothetical license negotiation because the '988 Patent was a "bottleneck asset" as of 2006.<sup>366</sup>
161. Nowhere has Ms. Lawton explained precisely what she means by the term "bottleneck asset." In fact, according to Dr. Fullerton, to the extent the '988 Patent could be deemed to be a "bottleneck asset," there were thousands of other "bottleneck assets" as of 2006.<sup>367</sup>

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<sup>361</sup> Lawton Report, ¶42.

<sup>362</sup> Lawton Report, ¶42 (emphasis added).

<sup>363</sup> "NSF Engineering Research Centers - Creating New Knowledge, Innovators and Technologies For Over 30 Years," *National Science Foundation*, at 6, available at <http://erc-assoc.org/sites/default/files/download-files/ERC%2030th%20anniversary%20brochure.pdf>. (accessed July 10, 2018).

<sup>364</sup> SEA02238164-70, at 67.

<sup>365</sup> Fullerton Report, ¶¶ 897, 902.

<sup>366</sup> *See, e.g.*, Lawton Report, ¶¶ 403, 925(b). Ms. Lawton further asserted that "the '988 patent discloses technology that enabled PMR HDDs." Lawton Report, ¶125. Nowhere has Ms. Lawton explained what she means by "enabled PMR HDDs," nor has she cited to any source saying that the '988 Patent "enabled PMR HDDs."

<sup>367</sup> Conversation with Fullerton.



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162. Ms. Lawton has used this construct of a “bottleneck asset” to conclude that LMS would and should be able to extract value beyond that contributed by the ‘988 Patent because of Seagate’s earlier and substantial commitment to PMR. In economics, this is known as “hold-up,” which was defined by Farrell *et al.*:

...opportunism or hold-up arises when a gap between economic commitments and subsequent commercial negotiations enables one party to capture part of the fruits of another’s investment, broadly construed. Hold-up can arise, in particular, when one party makes investments specific to a relationship before all the terms and conditions of the relationship are agreed. Hold-up generally leads to economic inefficiency that contracting parties, and courts interpreting contracts, often try to avoid.<sup>368</sup>

163. The problem of hold-up can be demonstrated using a simplified example.<sup>369</sup> Consider a manufacturer who has two options for developing a product: “Method 1,” which does not require the use of any patented technology, and costs \$50 to complete, or “Method 2,” which utilizes a patented technology but costs only \$40 to complete. All other things being equal, the manufacturer would reasonably be willing to pay up to \$10 for use of the patented technology, allowing it to manufacture using Method 2 at or below the cost of Method 1. Thus, absent any additional information, the patented technology may have a value of \$10 that can be split between the licensor and the licensee.

164. Consider, as well, a second company seeking to manufacture the same product and with access to the same manufacturing methods. Company 2, however, has already invested \$25 towards production using Method 2 prior to the start of license negotiations with the patent owner. This investment has no value towards production under Method 1. At this point, the remaining cost to build the product is \$15 (the \$40 full production cost less \$25 already

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<sup>368</sup> Joseph Farrell, *et al.*, “Standard Setting, Patents, and Hold-Up,” *Antitrust Law Journal*, Vol. 74, No. 3 (2007), 603-70, at 603-04.

<sup>369</sup> The example here is modeled after Farrell *et al.* (2007).

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invested) under Method 2 or \$50 (the full production cost) under Method 1. The patent owner could thus seek payment of up to \$35 for use of the patented technology, representing the maximum amount *at this point* that makes Method 2 more economical than Method 1.<sup>370</sup> The current value is therefore higher than the \$10 inherent value of the patented technology that exists *prior to making any investment commitments*. This situation, in which the patent owner seeks to capture value greater than the inherent contributions of the patented technology to the product, reflects “hold-up.”

165. Using the hypothetical negotiation framework, the negotiation occurs on the eve of first alleged infringement, a point where the licensee has likely already committed resources – and substantial resources – to the allegedly infringing activity. As a result, the options available to the licensee here (Seagate) to avoid infringement, including the use of alternative technology or the decision to forego the project entirely, usually have narrowed sufficiently such that the licensor would be able to extract a royalty in excess of the actual value of the patented technology to the licensee.<sup>371</sup> This additional value is not attributable to the patented technology as it is used in the licensee’s product, but rather extracts value based on the disruptive effect that would result from forcing the licensee to abandon its existing investments and adopt a different technology instead. As noted above, reasonable

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<sup>370</sup> Calculated as the \$50 cost of using Method 1 less the \$15 remaining cost to use Method 2.

<sup>371</sup> Shapiro (2000) discusses the impact of timing on patent values: “Suppose that our representative manufacturer could, with ease, invent around a given patent, if that manufacturer were aware of the patent and afforded sufficient lead time. Clearly, in this case the patented technology contributes little if anything to the final product, and any reasonable royalty would be modest at best. But, oh, how the situation changes if the manufacturer has already designed its product and placed it into large scale production before the patent issues. In this case, even though the timing is strongly suggestive that the manufacturer did not in fact rely on the patented invention for the design of its product, the manufacturer is in a far weaker negotiating position. The patentee can credibly seek far greater royalties, very likely backed up with the threat of shutting down the manufacturer if the Court indeed finds the patent valid and infringed and grants injunctive relief.” Carl Shapiro, “Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting,” in *Innovation Policy and the Economy*, 1 (2000), 119-50, at 125.

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royalty damages should *not* include amounts beyond that which was contributed by the patent-at-issue, so the potential for hold-up creates a risk of over-compensating the patent holder for the infringement.<sup>372</sup>

166. Here, the hypothetical negotiation occurs at the point of the first alleged infringement by Seagate, a point at which Seagate has committed significant resources into developing a PMR hard drive and the associated manufacturing infrastructure necessary to commercialize this hard drive. Ms. Lawton opined that the timing of the hypothetical negotiation means that LMS should be able to expropriate rents in excess of the inherent advantages attributable to the use of the patented technology based on the existence of Seagate's committed investments. These additional rents do not represent value intrinsic to the patented technology, but rather value attributable to Seagate's sunk investments.<sup>373</sup> It is inappropriate to allocate a portion of the value of these investments to the patented technology itself, as Ms. Lawton's analysis does.
167. The U.S. Federal Trade Commission's ("FTC's") 2011 report titled "The Evolving IP Marketplace—Aligning Patent Notice and Remedies with Competition,"<sup>374</sup> ("FTC Report") which resulted from the hearings Ms. Lawton cited more than 40 times in her report but which was not cited by Ms. Lawton, defined hold-up:

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<sup>372</sup> The adverse effects of hold-up can be particularly acute in multi-patent products, such as hard drives and other technology products, due to the number of patents such products utilize. In such products and technologies, the royalties paid by the licensee to one licensor affect the amount that can be paid to other licensors. A licensor who demands royalties far in excess of the inherent value of its patents may prevent the licensee from licensing the other necessary patents while still maintaining the required cost structure to make the downstream product profitable. *See, e.g.,* Mark A. Lemley and Carl Shapiro, "Patent Holdup and Royalty Stacking," *Texas Law Review* Vol. 85 (2007), 1991-2049, at 2010-14.

<sup>373</sup> *See* Mark A. Lemley and Carl Shapiro, "Patent Holdup and Royalty Stacking," *Texas Law Review* Vol. 85 (2007), 1991-2049, at 1991.

<sup>374</sup> Available at <https://www.ftc.gov/sites/default/files/documents/reports/evolving-ip-marketplace-aligning-patent-notice-and-remedies-competition-report-federal-trade/110307patentreport.pdf> (accessed July 16, 2018).

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As it chooses technologies to incorporate into a new product, a manufacturer will often make investments (e.g., building manufacturing facilities) based on that choice that make it more costly to switch to an alternative. If the hypothetical negotiation is deemed to take place after investments have increased switching costs, the reasonable royalty may be higher than it would have been at the time of the design choice.<sup>375</sup>

The FTC unequivocally recommended that “courts should not award reasonable royalty damages” that embody value associated with hold-up.<sup>376</sup> The resulting “overcompensation” associated with hold-up value could raise prices while undermining efficient consumer choices.<sup>377</sup>

168. Ms. Lawton’s claim that “the ‘988 Patent discloses technology that enabled PMR HDDs,”<sup>378</sup> and her corresponding suggestion that the ‘988 Patent “created” four economic benefits – (1) “Cost Savings Attributable to Lower Component Count”; (2) “Cost Savings Attributable to Increased Yield”; (3) “Increased Revenue and Profits Attributable to an Expanded Market”; and (4) “Increased Revenue and Profits Attribute to Increased Market Share”<sup>379</sup> – reflects an improper allocation of the value of all of PMR to the ‘988 Patent.
169. As an illustration of her overestimation of the value of the ‘988 Patent, Ms. Lawton calculated a “range of cost savings that Seagate expected to realize based on the reduction in PMR heads required to achieve a given HDD capacity point compared to the number of LMR heads required in a reasonably comparable drive.”<sup>380</sup> She wrote that Seagate achieved \$4.30 to \$12.00 in cost savings because PMR HDDs required a smaller number of heads than LMR HDDs.<sup>381</sup> Ms. Lawton then concluded that “the ‘988 Patent contributed to this

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<sup>375</sup> FTC Report, at 22. *See also*, FTC Report, at 191.

<sup>376</sup> FTC Report, at 22.

<sup>377</sup> FTC Report, at 22.

<sup>378</sup> Lawton Report, ¶ 125.

<sup>379</sup> Lawton Report, ¶¶ 172-204.

<sup>380</sup> Lawton Report, ¶ 932.

<sup>381</sup> Lawton Report, ¶ 933.

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cost savings ... [and that it] can be used to determine the reasonable royalty for the use of the '988 Patent."<sup>382</sup>

170. As described above, there are multiple technologies and components that contribute to the benefits offered by PMR technology.<sup>383</sup> As noted above, according to Dr. Fullerton, the claimed invention of the '988 Patent is not directed to an essential feature of PMR.<sup>384</sup> The two most important features that needed to be addressed to enable PMR were the design of media components and the geometry of the write head, neither of which is addressed by the '988 Patent.<sup>385</sup>
171. By asserting that the timing of the hypothetical negotiation would have allowed the '988 Patent to be a "bottleneck" that could have kept Seagate from enabling PMR,<sup>386</sup> Ms. Lawton inappropriately attributed significantly more value to the '988 Patent than the underlying technology contributed. Moreover, by examining and discussing the price and costs of the end product (the HDD) without showing that the patent alone drove demand for the end product, she likely has inappropriately invoked the Entire Market Value Rule.<sup>387</sup>

## 2. "Benchmarks"

172. Ms. Lawton identified four benchmarks for her estimation of a royalty rate.<sup>388</sup> Those were

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<sup>382</sup> Lawton Report, ¶ 934. *See also*, Lawton Report, ¶ 1008, where Ms. Lawton presented her cost savings estimate as (inappropriate) context for her assertion that the '988 Patent contributed "\$0.30 to \$0.40/HGA in additional profit attributable to '988 patented invention."

<sup>383</sup> *See, e.g.*, Fullerton Report, ¶¶ 858-77.

<sup>384</sup> Conversation with Fullerton.

<sup>385</sup> Conversation with Fullerton.

<sup>386</sup> *See, e.g.*, Lawton Report, ¶¶ 47, 125, 151, 152, 167, 172, 403, 479, 925(a).

<sup>387</sup> *VirnetX, Inc. and Science Applications International Corp. v. Cisco Sys.*, 767 F.3d 1308, 1329 (Fed. Cir. 2014); *Astrazeneca AB v. Apotex Corp.*, 782 F.3d 1324, 1337 (Fed. Cir. 2015); *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, No. 2016-2691, 2018 WL 3233107, at \*10 F.3d (Fed. Cir. July 3, 2018).

<sup>388</sup> In her report, Ms. Lawton also included a discussion of *Seagate Technology, LLC v. Western Digital*, which she characterized as "A Case Study Regarding the Value of Recording Head Technology in October 2006" (Lawton Report, ¶¶ 640-43). As she explained, that case pertained to Western Digital's alleged theft and misappropriation of "Seagate's trade secrets and confidential information regarding TMR technology" (Lawton Report, ¶ 640). It is unclear, and Ms. Lawton did not explain, how that case provides any assistance to the trier

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(1) certain (but not all) technology licenses granted by Censtor Corp. (“Censtor”); (2) Acacia’s Samsung valuation model; (3) the Headway-Seagate License; and (4) the amount for which TDK and LMS settled the litigation associated with TDK’s alleged infringement of the ‘988 Patent. Ms. Lawton’s analysis of those benchmarks was flawed.

**a. Censtor Licenses**

173. Ms. Lawton wrote that, as of August 1995, Censtor had entered into license agreements with six companies: Fujitsu, Maxtor, IBM, Hitachi, MiniStor, and NEC.<sup>389</sup> She wrote further that Censtor believed that these companies “‘bought the licenses based upon their expectations that the Company’s technologies will be the mainstream technologies of the future.’”<sup>390</sup> Further, according to Ms. Lawton, Plaintiff’s technical expert, Dr. Coffey, characterized the Censtor patents as “‘at least marginally technologically comparable’ to the ‘988 Patent.’”<sup>391</sup> She asserted that those six license agreements are *economically* comparable to the ‘988 Patent for several reasons.<sup>392</sup>

- They “‘were made at the time of a major technology transition to MR heads.’”<sup>393</sup>
- “‘Censtor was pursuing a licensing strategy that ‘initially targeted disk drive companies focused on ... market segmetns [sic] where [Censtor] believes the advantages of its technology should be most compelling.’”<sup>394</sup>
- “‘The Censtor technology was characterized as contributing to increased areal density,

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of fact and/or is relevant to an analysis of royalty that would have been paid for the hypothetical license covering the ‘988 Patent.

<sup>389</sup> Lawton Report, ¶ 1001.

<sup>390</sup> Lawton Report, ¶ 708.

<sup>391</sup> Lawton Report, ¶ 1000.

<sup>392</sup> Lawton Report, ¶ 1002.

<sup>393</sup> Lawton Report, ¶ 1002(a).

<sup>394</sup> Lawton Report, ¶ 1002(b).

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which is the advantage of the '988 Patent.”<sup>395</sup>

- Both Censtor and LMS claimed that their respective technologies would become “mainstream recording technologies.”<sup>396</sup>
- Both Censtor and LMS believed that there were “no acceptable, available, non-infringing alternatives” to their respective technologies.<sup>397</sup>
- Those Censtor license agreements were not negotiated under the threat of litigation.<sup>398</sup>

174. Although Censtor subsequently entered into license agreements with other entities, including Western Digital<sup>399</sup> and TDK,<sup>400</sup> and licensed and subsequently sold its entire portfolio of patents to Seagate, Ms. Lawton claimed that those transactions are not relevant because of Censtor's financial condition at the time.<sup>401</sup>

175. Ms. Lawton then concluded that “the license fees and royalty rates set forth in [the six Censtor license agreements as of August 1995] together with the per head royalties outlined in the June 19, 1995 Censtor-CRT license agreement provide a valuation metric to establish the reasonable royalty in this case.”<sup>402</sup> Citing to the range of royalty rates in the Censtor-CRT license agreement of \$0.30 to \$1.20 per unit, Ms. Lawton concluded that “the starting point valuation metric is the Censtor Corp.-Hitachi rate of **\$0.30 per unit** because it is based on a more limited number of Censtor patents and expressly excludes technology and know-how.”<sup>403</sup>

176. Ms. Lawton appeared to ignore many critical terms of the agreements negotiated between

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<sup>395</sup> Lawton Report, ¶ 1002(c).

<sup>396</sup> Lawton Report, ¶ 1002(d).

<sup>397</sup> Lawton Report, ¶ 1002(e).

<sup>398</sup> Lawton Report, ¶ 1002(f).

<sup>399</sup> LAMBETH-000276154-217, at LAMBETH-000276157.

<sup>400</sup> LAMBETH-000276290-305, at LAMBETH-000276297.

<sup>401</sup> Lawton Report, ¶¶ 718, 723, 1001.

<sup>402</sup> Lawton Report, ¶ 1003.

<sup>403</sup> Lawton Report, ¶ 1004 (emphasis in original).

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Censtor and its licensees. She did not, for example, consider the amounts paid by Hitachi, Fujitsu, Maxtor, IBM, MiniStor, and NEC for access to Censtor's patents (and in many cases, product designs and know-how). Rather, the range of royalty rates that she relied upon comes from an agreement between Censtor and its related manufacturing subsidiary, CRT, and pertains to the royalties that CRT would pay to Censtor on potential future sales of component products by CRT to those companies (including Hitachi). As explained in greater detail below, the Censtor-Hitachi agreement, to which Ms. Lawton pointed as the "starting point," consisted of a lump-sum payment of \$4,950,000 from Hitachi to Censtor, which included license fees and pre-paid royalties.<sup>404</sup> Therefore, to the extent Ms. Lawton found that agreement, which granted Hitachi access to multiple patents, to be particularly relevant to her valuation analysis, it would suggest that "the starting point valuation metric" for her analysis of the royalty form and value of the '988 Patent would have been a lump-sum payment of \$4,950,000.

177. Censtor was created in 1981 "to develop perpendicular recording technology for disk drives."<sup>405</sup> Until 1995, Censtor did not plan to manufacture or sell disk drives or components; rather, its business model had been "to license contact recording technology to disk drive manufacturers and then to transfer the technology to them and their designated head and disk suppliers for production of heads, media and disk drives."<sup>406</sup>
178. Over time, Censtor incurred tens of millions of dollars in R&D expenses<sup>407</sup> to develop a

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<sup>404</sup> Lawton Report, ¶ 1004; LAMBETH-000254815-900, at LAMBETH-000254821.

<sup>405</sup> LAMBETH-000254597-678, at LAMBETH-000254608.

<sup>406</sup> LAMBETH-000254597 - LAMBETH-000254678, at LAMBETH-000254598; and LAMBETH-000260377 - LAMBETH-000260794, at LAMBETH-000260384.

<sup>407</sup> According to one estimate from 1989, "Censtor has spent close to \$40 million in PMR research and development." Clark E. Johnson, Jr., Laurence B. Lueck, "A History of Perpendicular Magnetic Recording in the United States," *Journal of the Magnetism Society of Japan*, 1989, 49-52, at 52, available at [https://www.jstage.jst.go.jp/article/jmsjmag/13/S\\_1/PMRC\\_89/13\\_S\\_1/PMRC\\_89\\_S1\\_49/\\_pdf](https://www.jstage.jst.go.jp/article/jmsjmag/13/S_1/PMRC_89/13_S_1/PMRC_89_S1_49/_pdf).) (accessed



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portfolio of technologies that was to be “embodied in heads that are smaller, lighter and less costly to manufacture than competing products and in special surface treatments for disk media that allow continuous head/disk contact during operation without excessive wear.”<sup>408</sup> Censtor’s R&D was carried out by three main groups: (1) a group dedicated to “increasing areal recording density by implementing advanced transducer designs, materials and processing methods” and “by introducing new materials and manufacturing processes;” (2) an engineering team tasked to “develop and support improvements in head and suspension mechanical designs, head and media wear characteristics, long-term data reliability, test equipment capabilities and tooling designs”; and (3) a group dedicated to the development of the processes, tooling and equipment required to establish pilot production and the transition to efficient high-volume manufacturing.<sup>409</sup>

179. As of September 30, 1994, Censtor’s patent portfolio “included eleven issued United States patents, nineteen pending United States patent applications, seven foreign patents and a number of foreign patent applications.”<sup>410</sup> Its patents included “three United States patents covering the structure, process and application of low-mass contact recording devices and two additional United States patents covering improvements and advancements relating to these patents.”<sup>411</sup> As part of its effort to facilitate adoption of the company’s technology, Censtor worked closely with potential component suppliers “to establish manufacturing capacity for disk drive heads and disks incorporating the Company’s technology,”<sup>412</sup> and

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July 11, 2018). In the three-year period prior to September 1995, Censtor had incurred between \$9.0 million and \$12.0 million annually in support of on-going research and development activities. LAMBETH-000254597-678, at LAMBETH-000254599.

<sup>408</sup> LAMBETH-000254597-678, at LAMBETH-000254598.

<sup>409</sup> LAMBETH-000260377-794, at LAMBETH-000260385.

<sup>410</sup> LAMBETH-000260377-794, at LAMBETH-000260386.

<sup>411</sup> LAMBETH-000260377-794, at LAMBETH-000260386.

<sup>412</sup> LAMBETH-000260377-794, at LAMBETH-000260378.

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“to ensure the adequacy, quality and reliability of their output.”<sup>413</sup>

180. By mid-1994, Censtor had entered into license agreements with three disk drive manufacturers: Fujitsu, Maxtor, and IBM.<sup>414</sup> In 1994 and 1995, “Censtor developed a contact longitudinal head and head-disk interface technology that enabled the Company to sell three additional licenses [to Hitachi, MiniStor, and NEC],”<sup>415</sup> and increased the size of its patent portfolio accordingly.<sup>416</sup> According to Censtor, “the Company’s licensees often require significant technical assistance from the Company.”<sup>417</sup> As such, “[t]he specific terms of the license agreements vary depending on when the licenses were entered into, whether or not the Company has rights to future royalty payments from the licensee, whether the license extends to not only the Company’s patents but also its trade secret information, and whether the licensee is expected to become a component supplier.”<sup>418</sup>

- In February 1991, Censtor entered into a license agreement with Fujitsu, pursuant to which Censtor granted Fujitsu access to all patents and claims in issued patents or patent applications, as well as “all Confidential Information, technology, know-how and manufacturing processes which apply to the Censtor Products and Censtor Improvements.”<sup>419</sup> According to Censtor, “Fujitsu’s license is fully paid and royalty free; however, it does not allow for the incorporation of certain advanced technologies

<sup>413</sup> LAMBETH-000260377-794, at LAMBETH-000260381.

<sup>414</sup> LAMBETH-000260377-794, at LAMBETH-000260380.

<sup>415</sup> LAMBETH-000276829-908, at LAMBETH-000276847.

<sup>416</sup> LAMBETH-000254597-678, at LAMBETH-000254601.

<sup>417</sup> LAMBETH-000260377-794, at LAMBETH-000260391.

<sup>418</sup> LAMBETH-000254597-678, at LAMBETH-000254601. Based on available information, it appears that two or three of Censtor’s licenses included royalties on the future sales of products incorporating the Company’s technology. All other agreements consisted of pre-paid royalties. LAMBETH-000254815-900, at LAMBETH-000254823: “These licenses agreements have generally included an initial fee, which is paid either at the inception of the license or on an installment basis and, for two of its current licenses [as of February 1995], royalties on the future sale of products incorporating the Company’s technology.”

<sup>419</sup> LAMBETH-000260377-794, at LAMBETH-000260633.

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- in combination with the Company's micro Flexhead® components without the payment of additional royalties ... Fujitsu has the right under its license to require Censtor to transfer its know-how to subcontract head and media suppliers.”<sup>420</sup> In exchange, Fujitsu paid license fees totaling \$5.2 million, as well as “a nonrefundable payment of \$4,000,000 in lieu of future royalties on the sale of products incorporating the Company's technology.”<sup>421</sup>
- In September 1991, Censtor entered into a license agreement with Maxtor, which included the right to all of Censtor's patents and claims in issued patents or patent applications, all confidential information, technology, know-how and manufacturing processes, as well as samples and technical support from Censtor.<sup>422</sup> As of December 1995, “Maxtor [was] currently developing small form factor disk drives and Censtor is building prototype disk drives based upon a modified Maxtor design and incorporating micro Flexhead® components to permit Maxtor to evaluate the use of Censtor's technology in these disk drives.”<sup>423</sup> Based on available information, it appears that in exchange for the license, Maxtor paid license fees totaling \$2.2 million, with a potential additional license fee of \$3 million on the achievement of specified milestones.<sup>424</sup>
  - In June 1993, Censtor granted to IBM a nonexclusive license to “all patents, utility models, and design patents, issued or issuing on patent applications,” that were filed (or to be filed) prior to June 1, 1999. The license did not grant IBM access to certain of Censtor's trade secrets.<sup>425</sup> As part of the license agreement, Censtor was granted rights

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<sup>420</sup> LAMBETH-000260115-96, at LAMBETH-000260120.

<sup>421</sup> LAMBETH-000260377-794, at LAMBETH-000260440.

<sup>422</sup> LAMBETH-000260377-794, at LAMBETH-000260582-626.

<sup>423</sup> LAMBETH-000254747-814, at LAMBETH-000254751.

<sup>424</sup> LAMBETH-000260377-794, at LAMBETH-000260440.

<sup>425</sup> LAMBETH-000260377-794, at LAMBETH-000260745-72.

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- to any patents that IBM receives on improvements made by IBM to Censtor's technology. In exchange, IBM agreed to pay Censtor a specified amount in royalties, after which "IBM will have no further obligation to make additional royalty payments."<sup>426</sup> Based on available information, it appears that in exchange for the license, IBM paid a lump-sum license fee of \$4.5 million.<sup>427</sup>
- According to Censtor, in December 1994, Hitachi "purchased a paid-up license to the Company's patents issued and applied for as of December 31, 1994 as well as the Company's initial patent, when and if applied for and issued, covering Censtor's contact longitudinal head design. The amount paid included an initial licensee fee and prepaid royalties."<sup>428</sup> According to available information, in return for a license to all of Censtor's patents and applications "relating to data storage devices and processes for manufacturing such devices," Hitachi paid a nonrefundable license fee of \$4,950,000, "which was subject to withholding a 10% tax by the Japanese authorities."<sup>429</sup>
  - In November 1994, MiniStor "demonstrated a disk drive prototype built in conjunction with Censtor," and in December 1994, "MiniStor purchased a license to acquire components incorporating Censtor's technology from qualified suppliers and to use those components in building and selling disk drives in exchange for the payment of an up-front fee in cash plus a promissory note as well as royalties due upon the sale of disk drives utilizing such components."<sup>430</sup> As part of the license agreement, MiniStor

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<sup>426</sup> LAMBETH-000260377-794, at LAMBETH-000260380.

<sup>427</sup> LAMBETH-000260377-794, at LAMBETH-000260440.

<sup>428</sup> LAMBETH-000254597-678, at LAMBETH-000254601.

<sup>429</sup> LAMBETH-000254815-900, at LAMBETH-000254821.

<sup>430</sup> LAMBETH-000254597-678, at LAMBETH-000254602.

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also had an option to acquire the right to Censtor's know-how in exchange for an additional fee.<sup>431</sup> In exchange for the license, Censtor received from MiniStor \$25,000 and a promissory note for \$3,475,000 due on December 6, 1996. To the extent MiniStor adopted Censtor's technology in its data storage devices, MiniStor would pay royalties upon the sale of data storage devices that included that technology.<sup>432</sup> In 1996, Censtor reported that "MiniStor is currently operating under protection of Chapter 11 of the United States Bankruptcy Code. However, the Company is not dependent upon, nor does it plan to derive a significant portion of its revenues from, sales to MiniStor."<sup>433</sup>

- In August 1995, Censtor entered into a royalty-bearing license with NEC that granted NEC a license to all Censtor patents and know-how as of December 31, 1995.<sup>434</sup> In return, NEC paid to Censtor an initial license fee of \$3.3 million, and agreed to pay a running royalty based on net sales of products that incorporated Censtor's technology.<sup>435</sup>

181. The royalty amounts paid by each of Censtor's licensees do not appear to be directly associated with the licensee's volume of HDD sales. Tab 15 presents the royalty payments by each of Censtor's licensees, as well as their estimated volume of HDDs shipped during the year in which the license was granted. Maxtor paid \$2.2 million in license fees for the Censtor patents in 1991, when it sold approximately 2.5 million HDDs; NEC paid a greater amount (\$3.3 million) for the Censtor patents in 1995, when it sold approximately 450,000

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<sup>431</sup> LAMBETH-000254597-678, at LAMBETH-000254602.

<sup>432</sup> LAMBETH-000254815-900, at LAMBETH-000254820-21.

<sup>433</sup> LAMBETH-000260351-76, at LAMBETH-000260358.

<sup>434</sup> LAMBETH-000254747-814, at LAMBETH-000254788-814.

<sup>435</sup> LAMBETH-000254747-814, at LAMBETH-000254788-814.

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HDDs, substantially fewer than Maxtor.<sup>436</sup> Ms. Lawton did note “[t]he variability in Censtor’s royalty rates,” which she attributed, in part, to “the scope of the grant to each licensee”<sup>437</sup> – *i.e.*, whether the license granted access to more than the Censtor patents, such as know-how. The different fees paid by Censtor’s licensees could also be impacted by the number of patents covered by the license. For example, the patent portfolio licensed to NEC was larger than it was at the time of the Maxtor license.<sup>438</sup>

182. In June 1995, as part of a tactical shift in its business strategy, Censtor formed a new subsidiary, Contact Recording Technology, Inc. (“CRT”), “to develop and manufacture contact longitudinal data storage heads for the computer disk drive industry.”<sup>439</sup> According to Censtor, CRT was “formed to accelerate the rate at which products using Censtor’s technology are put into volume manufacturing.”<sup>440</sup> Censtor and CRT entered into a license agreement that granted CRT the right to all Censtor patents and claims, trademarks, and “all Confidential Information, technology, know-how and manufacturing processes which apply to recording head devices and Censtor Improvements.”<sup>441</sup> In addition, Censtor was to provide to CRT “training, office space, and access to such of Censtor’s equipment as may be reasonably necessary to enable such personnel to practice the Censtor Technology.”<sup>442</sup> In return, CRT issued Censtor shares of Series A preferred stock. Additionally, to the extent CRT was able to sell products that incorporate or were

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<sup>436</sup> Tab 15.

<sup>437</sup> Lawton Report, ¶ 711

<sup>438</sup> For example, prior to the NEC license agreement, “Censtor developed a contact longitudinal head and head-disk interface technology,” which increased the size of its patent portfolio. LAMBETH-000260377-794, at LAMBETH-000260582-626; LAMBETH-000254597-678 at LAMBETH-000254601; LAMBETH-000276829-908, at LAMBETH-000276847.

<sup>439</sup> LAMBETH-000254597-678, at LAMBETH-000254625.

<sup>440</sup> LAMBETH-000254597-678, at LAMBETH-000254698.

<sup>441</sup> LAMBETH-000254597-678, at LAMBETH-000254664-65.

<sup>442</sup> LAMBETH-000275988.

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manufactured using any Censtor patents, information, technology, know-how, or manufacturing processes to Censtor's then-current licensees, CRT would pay pre-specified and licensee-specific royalty amounts ranging from \$0.30 to \$1.20 to Censtor.<sup>443</sup>

183. Ms. Lawton inappropriately conflated the royalty amounts that Censtor would receive from its related manufacturing subsidiary on sales to its then-current licensees of finished component products that embodied Censtor's patents, technologies, designs, information, and know-how, with the royalty amounts that its licensees actually paid for access to its patents. The range of per-unit royalty values of \$0.30 to \$1.20 presented by Ms. Lawton do not reflect the results of a negotiation between Censtor and its licensees.
184. According to Ms. Lawton, the Hitachi license did not include know-how, and was therefore most similar to the license to the '988 Patent that would have resulted from the hypothetical negotiation.<sup>444</sup> While the Censtor-Hitachi license included multiple patents, and therefore may be more valuable than a license to a single patent, I agree that a license that excludes know-how and product designs would be more comparable to the license to the '988 Patent. The negotiation for the license between Censtor and Hitachi resulted in a lump-sum payment of \$4.95 million with no running royalties.<sup>445</sup>

**b. Acacia's Samsung Presentation**

185. The range of royalty amounts included in Ms. Lawton's valuation analysis for the '988 Patent also included an estimate based, in part, on the presentation by Acacia that included a model of estimated potential damages that *could* be claimed from Samsung's alleged infringement of the '988 Patent.<sup>446</sup> Ms. Lawton adopted one of the inputs to the potential

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<sup>443</sup> LAMBETH-000254597-678, at LAMBETH-000254666-76.

<sup>444</sup> Lawton Report, ¶ 1004.

<sup>445</sup> Lawton Report, ¶ 1004; LAMBETH-000254815-900, at LAMBETH-000254821.

<sup>446</sup> Lawton Report, ¶ 1008.

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damages model – [REDACTED] – but ignored other inputs in the model, such as [REDACTED]. Instead, she assumed a per-unit selling price of \$8 per HGA, and concluded that the corresponding valuation metric would be \$0.40 per unit ( $\$8 * 5 \text{ percent}$ ).<sup>448</sup>

186. In addition to the fact that Ms. Lawton did not explain her inconsistent treatment of the inputs to Acacia's damages model (using some, but not all of the assumptions), available evidence indicates that the [REDACTED] royalty rate *assumed* by Acacia's damages model does not provide an informed or reliable basis upon which to estimate the value of the '988 Patent.

187. At or around the time LS assigned the '988 Patent and its foreign counterparts<sup>449</sup> in December 2010,<sup>450</sup> Acacia had already been in negotiations with Samsung over other patent rights.<sup>451</sup> As such, Acacia considered Samsung to be its "first priority" among hard disk drive manufacturers with which to seek a license agreement.<sup>452</sup> On December 21, 2010, Acacia prepared a presentation in which it developed an estimate of potential damages attributable to Samsung's alleged infringement of the '988 Patent and its foreign equivalents.<sup>453</sup>

188. To estimate damages, [REDACTED]

[REDACTED]

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<sup>447</sup> Lawton Report, ¶ 988.

<sup>448</sup> Lawton Report, ¶ 992.

<sup>449</sup> Foreign counterparts to the '988 Patent consisted of patents granted in Singapore, Korea, and Japan, as well as a pending patent in the European Union. Mitchell Deposition, Exhibit 20, at 4-5.

<sup>450</sup> LS and Acacia (through Acacia's wholly owned subsidiary) ultimately entered into an agreement effective December 18, 2010, in which LS assigned the '988 Patent and its foreign counterparts to Acacia. Mitchell Deposition, Exhibit 2.

<sup>451</sup> Mitchell Deposition, at 159.

<sup>452</sup> Mitchell Deposition, at 159.

<sup>453</sup> Mitchell Deposition, Exhibit 15, at 5.



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189. According to Acacia's 30(b)(6) witness, Mr. Phillip Mitchell, the assumption of a 5 percent royalty rate did not necessarily reflect what Acacia had expected to be able to attain from a negotiated license agreement.<sup>456</sup> Rather, he explained that "[a] royalty rate is assumed [REDACTED]. You're making the assumption that you're going – that – that these numbers for damages or the – that you're calculating here are, in fact, the reality of what they are .... You rarely ever get this type of number."<sup>457</sup> Indeed, there is no evidence that inputs from the presentation's damages model ultimately contributed to the license agreement that was actually negotiated with Samsung. Rather, the real-world negotiation between Acacia and Samsung called for a payment that was substantially lower than Acacia's preliminary estimate of license fees for the '988 Patent.
190. According to Mr. Mitchell, at the time when Acacia was negotiating the Samsung agreement, Acacia "had more experience than I believe any other publicly traded company in this field [patent licensing by non-practicing entities]," and had "more experience and bargaining power than the average patent owner when it came to licensing."<sup>458</sup>
191. On March 2, 2011, Acacia entered into an Option Agreement with Samsung that [REDACTED]

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<sup>454</sup> Mitchell Deposition, Exhibit 15, at 5.

<sup>455</sup> Mitchell Deposition, Exhibit 15, at 5.

<sup>456</sup> Mitchell Deposition, at 207-08.

<sup>457</sup> Mitchell Deposition, at 207-08 (emphasis added). As Ms. Lawton is well aware, patent damages law has evolved substantially from the point at which a 5 percent royalty rate was assumed by Acacia to be a reasonable starting estimate.

<sup>458</sup> Mitchell Deposition, at 38-41.

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED].<sup>461</sup>

192. Ms. Lawton apparently ignored the license that resulted from an actual negotiation between Samsung and Acacia, and Acacia's allocation of the value attributable to the '988 Patent. Instead, for purposes of her valuation analysis for the '988 Patent, she relied on a single input, the [REDACTED] royalty rate assumption, from Acacia's preliminary damages estimate. Given Acacia's own use of its assumed [REDACTED] royalty rate as a placeholder and the fact that it did not inform the license payment that actually resulted from the negotiation between Acacia and Samsung, it does not reflect what would have resulted from the hypothetical negotiation.

193. Further, by disregarding [REDACTED] and replacing it with a higher average price (\$8.00 per head) from another source for her valuation, Ms. Lawton seems to conclude that certain of the inputs assumed by Acacia were unreliable. She did not explain why she believed one input to be reliable and another to be unreliable.<sup>462</sup>

194. By selectively picking one input from an estimate that did not contribute to, or even

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<sup>459</sup> Mitchell Deposition, Exhibit 3, at 2-3.

<sup>460</sup> Mitchell Deposition, Exhibit 3, at 3.

<sup>461</sup> Mitchell Deposition, at 44-52.

<sup>462</sup> Lawton Report, ¶ 990.

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approximate, the value that was ultimately negotiated, and then selectively picking another input from a different source, Ms. Lawton included in her valuation analysis an amount that fails to reflect what would have resulted from the hypothetical negotiation. Ms. Lawton's analysis here is improper.

195. Finally, Acacia knew that potential licensees for the '988 patent included Seagate, Western Digital, HGST, Toshiba, and Samsung.<sup>463</sup> According to Ms. Lawton's analysis, the value of a license to the '988 patent to Seagate was up to \$1.4 billion.<sup>464</sup> Yet, Acacia, who was one of the most experienced patent licensing companies in the world, decided to abandon that opportunity even though it would have presumably doubled Acacia's total historical revenues earned from over 1,200 licenses.<sup>465</sup> Real world transactions, again, appear to conflict with Ms. Lawton's view of the value of the '988 patent.

**c. Headway-Seagate License**

196. As explained by Ms. Lawton, beginning in 1995, Headway and Seagate entered into a series of agreements relating to MR head technology, "including a February 1, 1995 'Patent License Agreement' (a cross license), a May 19, 1995 'Cross License and Know-How Transfer Agreement,' and an April 24, 1998 Letter Agreement which was to extend the May 19, 1995 agreement and included the planned negotiation of a Wafer Supply Agreement."<sup>466</sup> Ms. Lawton concluded that these agreements (or perhaps a subset of them) are relevant to her valuation analysis for the '988 Patent because (1) they "provide insights regarding the value of technology during major technology transitions," namely the

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<sup>463</sup> Mitchell Deposition, at 72.

<sup>464</sup> Lawton Report, Seagate Schedule A.1.

<sup>465</sup> Mitchell Deposition, Exhibit 13.

<sup>466</sup> Lawton Report, ¶ 683.

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transition to thin film [DSMR] heads;<sup>467</sup> and (2) plaintiff's technical expert, Dr. Coffey, found that certain unidentified "Headway patents" are "'at least marginally technologically comparable' to the '988 Patent."<sup>468</sup> Ms. Lawton then presented a royalty range of \$0.15-\$0.50 per head that she attributed to the Headway-Seagate License.<sup>469</sup>

197. Ms. Lawton did not provide the source for the royalty range used in her valuation analysis of \$0.15-\$0.50 per head. As she indicated elsewhere in her report, all payment amounts were redacted from the Headway-Seagate agreements produced in this case and that are publicly available.
198. In addition, the Headway-Seagate agreements were cross licenses with each side providing technology, and Ms. Lawton admitted that "[c]ross licenses do not provide meaningful valuation data to assess a reasonable royalty in a hypothetical negotiation."<sup>470</sup>
199. Further, as noted by Ms. Lawton, the available information indicates that any royalties paid by Seagate to Headway would be capped at an undisclosed amount.<sup>471</sup> Therefore, even assuming that the per-unit royalty payments ranged from \$0.15-\$0.50, Ms. Lawton inappropriately ignored the fact that the total royalty payment by Seagate was capped, and would not necessarily apply to all of Seagate's sales. As of July 1999, Headway reported having received \$2.1 million in royalties associated with the license of its DSMR

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<sup>467</sup> Lawton Report, ¶ 993.

<sup>468</sup> Lawton Report, ¶ 1000. Ms. Lawton wrote in her report that "I understand from Dr. Coffey that only the Headway patents and Censtor patents, as shown in Table 9.2 below, are 'at least marginally technologically comparable' to the '988 Patent." Lawton Report, ¶ 1000. However, Table 9.2 cited by Ms. Lawton did not list any Headway patents. Lawton Report, ¶ 1000. In addition, the only technology that Dr. Coffey opined is comparable to the '988 Patent are certain Censtor patents and what Dr. Coffey calls "Dual Stripe MR technology." (Coffey Report, ¶¶ 108-09). The section of Dr. Coffey's report on "Dual Stripe MR technology," however, did not list or cite to any patents, either. Accordingly, the Headway patents on which Ms. Lawton bases her opinion (if any) are not clear.

<sup>469</sup> Lawton Report, ¶ 1008.

<sup>470</sup> Lawton Report, ¶ 436.

<sup>471</sup> Lawton Report, ¶¶ 688-89.

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technology to Seagate, and indicated that it “[did] not expect the royalty payments or purchase obligations to continue to be significant after the first half of fiscal year 2000.”<sup>472</sup>

While the total royalty amounts agreed to in the Headway-Seagate agreements are unclear, the available evidence suggests that they would not be substantially greater than \$2.1 million.

200. Finally, and perhaps most importantly, as described above, the component of the 1995 and 1998 agreements between Headway and Seagate that called for a running royalty pertained to the transfer of all technology and know-how necessary for Seagate to develop, fabricate, and/or manufacture Headway’s Dual Stripe MR heads, “including but not limited to schematics, flow charts, test methods, purchase specifications, engineering specifications, computer programs, technical data, software and log books.”<sup>473</sup> As such, these license agreements cover substantially more technologies than the license that would have resulted from the hypothetical negotiation, including all information needed to manufacture and sell component products.

**d. LMS-TDK License**

201. Ms. Lawton wrote that the March 30, 2017 license agreement between LMS and TDK associated with TDK’s alleged infringement of the ‘988 Patent “is not a relevant benchmark for establishing a reasonable royalty for Seagate’s use of the claimed invention of the ‘988 Patent in this case.”<sup>474</sup> However, she calculated an effective settlement per-unit royalty by dividing the [REDACTED] by her “estimate of Headway’s wafer and the related HGA volume in the U.S. during the period April 1, 2011 through

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<sup>472</sup> Lawton Report, ¶ 691.

<sup>473</sup> LAMBETH-000262599-3084, at LAMBETH-000262832.

<sup>474</sup> Lawton Report, ¶ 963.

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August 22, 2022.”<sup>475</sup> Based on her calculation, she found an effective royalty rate between \$0.010 to \$0.044 per HGA,<sup>476</sup> and included (but seemed to disregard) that range in her valuation analysis.<sup>477</sup> However, Ms. Lawton made an error in her calculation of the effective per-unit royalty rate implied by the LMS-TDK license.

202. As a result of the agreement, LMS granted to [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]<sup>479</sup>

203. Given the broad scope of the LMS-TDK agreement, the [REDACTED] amount did not just cover [REDACTED]  
[REDACTED]  
[REDACTED]. As such, by calculating the effective per-unit royalty based on her estimate of wafer (and the related HGA) volume in the U.S., Ms. Lawton substantially understated the volumes to which the [REDACTED] payment

<sup>475</sup> Lawton Report, ¶ 971.

<sup>476</sup> Lawton Report, ¶ 972.

<sup>477</sup> Lawton Report, ¶ 1008.

<sup>478</sup> Lambeth 02/26 Deposition, Exhibit 16, at LAMBETH-000222082 and 085.

<sup>479</sup> Lambeth 02/26 Deposition, Exhibit 16, at LAMBETH-000222079-80. I understand that the ‘988 Patent has active family members in Japan (JP04698142B2), South Korea (KR763285B1), and Europe (EP1435091B1) (in Ireland, Germany, Great Britain, France, and the Netherlands). The foreign patents were issued in June 2011 (Japan), October 2007 (Korea), and July 2014 (Europe). *See, e.g.*, <http://www.patentbuddy.com/Patent/7128988> (accessed July 16, 2018). Lambeth Deposition, Exhibit 8. The ‘988 Patent expires on August 22, 2022. Lawton Report, ¶968.

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applied.

204. Correcting her calculation to include TDK's worldwide actual and estimated head shipments (as provided by Ms. Lawton), the implied effective per-unit royalty rate falls from the range of \$0.010 - \$0.044 per unit to less than \$0.005 per unit.<sup>480</sup>
205. The effect of this correction to Ms. Lawton's calculation is notable because, even assuming that a per-unit running royalty would serve as the appropriate basis for damages in this case, when applied to the various royalty bases offered by Ms. Lawton, the corresponding damages amounts range from \$5.1 million to \$10.2 million.<sup>481</sup> These amounts are in line with valuations of other one-way, patent-only licenses that have been produced in this case, including those that granted access to the '988 Patent.<sup>482</sup>

### **3. *Georgia-Pacific* Analysis**

206. After conducting her purported valuation analysis of the '988 Patent, Ms. Lawton undertook a *Georgia-Pacific* analysis.<sup>483</sup> She determined that eight of the *Georgia-Pacific* factors had a neutral impact on the amount of the reasonable royalty, and four factors "would tend to *increase* the hypothetically negotiated royalty rate."<sup>484</sup> Ms. Lawton found that not a single factor would cut in favor of Seagate at a negotiation.
207. Ms. Lawton did not explain the benchmark against which she measured the impact of each *Georgia-Pacific* factor. In other words, she, on occasion, found that a particular factor

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<sup>480</sup> Tab 9.

<sup>481</sup> Tab 9.

<sup>482</sup> In Schedule A.2 of her report, Ms. Lawton presented her estimated royalty bases assuming a damages period from April 29, 2016 to December 31, 2017. Applying the corrected implied effective per-unit royalty rate to Ms. Lawton's royalty bases for this alternative damages period yields damages amounts ranging from \$1.1 million to \$2.2 million. Tab 9.

<sup>483</sup> Lawton Report, ¶ 1111.

<sup>484</sup> Lawton Report, ¶ 1159, ¶ 1175.

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would increase the rate,<sup>485</sup> but she did not explain what was being increased. By her analysis, a factor that would lead to an increase would always lead to an increase, regardless of the starting point.

208. Ms. Lawton ultimately concluded that “[t]he amount of the running royalty would be \$0.30 per HGA,”<sup>486</sup> which corresponds to the running royalty that she (incorrectly) attributed to the Censtor-Hitachi license agreement.<sup>487</sup> In addition to the fact that the license agreement negotiated between Censtor and Hitachi called for a lump-sum, royalty-free payment of \$4.95 million, Ms. Lawton’s flawed approach to the valuation of the ‘988 Patent resulted in a substantial overestimate of the license payment that would have resulted from the hypothetical negotiation.

#### 4. Smallest Salable Patent Practicing Unit<sup>488</sup>

209. As explained above, the Seagate component that allegedly uses the patented technology is

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<sup>485</sup> Lawton Report, ¶ 1150.

<sup>486</sup> Lawton Report, ¶ 1174.

<sup>487</sup> Lawton Report, ¶ 1004.

<sup>488</sup> According to the Federal Circuit, the base from which royalties should be calculated in a reasonable royalty analysis should, to the extent possible, reflect sales of the *smallest salable unit* that incorporates the technology at issue. As explained by the Federal Circuit,

We begin by noting that some products are made of many different components, one or more of which components may be covered by an asserted patent, while other components are not. This is especially true for electronic devices, which may include dozens of distinct components, many of which may be separately patented, the patents often being owned by different entities. To assess how much value each patented and non-patented component individually contributes to the overall end product—*e.g.*, a personal computer—can be an exceedingly difficult and error-prone task....

Where small elements of multi-component products are accused of infringement, calculating a royalty on the entire product carries a considerable risk that the patentee will be improperly compensated for non-infringing components of that product. Thus, it is generally required that royalties be based not on the entire product, but instead on the smallest salable patent-practicing unit.

*LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 66-67 (Fed. Cir. 2012), citing *Cornell Univ. v. Hewlett-Packard Co.*, 609 F. Supp. 2d 279, 283, 287-88 (N.D.N.Y. 2009).

The Federal Circuit has also written that, “[e]ven when a damages theory relies on the smallest salable unit as the basis for calculating the royalty, the patentee must estimate what portion of that smallest salable unit is attributable to the patented technology when the smallest salable unit itself contains several non-infringing features.” *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, No. 2016-2691, 2018 WL 3233107, at \*8 F.3d (Fed. Cir. July 3, 2018).





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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] I have conducted similar calculations based on total sales revenues and shipped volumes during the period FY 2010 through FY 2016, and found that the average price paid for a wafer level slider during this period was \$0.34.<sup>498</sup>

212. The average price of \$0.34 for an entire wafer level slider, which includes both the read and write heads, provides useful context to evaluate the reasonableness of the value that Ms. Lawton assigned to the '988 Patent. Specifically, her valuation of \$0.30 to \$0.40 per HGA for the '988 Patent implies that the value of the '988 Patent, which addresses one technology embodied in only one part of the write head, would constitute 88 to 118 percent of the total arm's-length price of the wafer level slider.<sup>499</sup> As there are multiple technologies embodied in a PMR wafer level slider unrelated to the '988 Patent (including all technologies embodied in the read head), Ms. Lawton's valuation for the '988 Patent is unreasonable.

**D. Royalty Base**

213. Ms. Lawton posited that the royalty base should be "Seagate's HGA units that have been incorporated into Seagate's HDD shipments."<sup>500</sup> As noted, between 2010 and 2017, Seagate Technology LLC in Minnesota and Seagate Technology (Ireland), Springtown

496

[REDACTED]

497

Shay Deposition, Exhibit 18.

498

[REDACTED]

*See, e.g.,* SEA01387725.

499

Calculated as  $(\$0.30/\$0.34) = 88$  percent;  $(\$0.40/\$0.34) = 118$  percent.

500

Lawton Report, ¶1009.

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Branch made wafers and shipped them overseas where they were ultimately incorporated into HDDs.<sup>501</sup> [REDACTED]

[REDACTED]

[REDACTED]

214. Ms. Lawton offered a number of alternative calculations in an attempt to estimate royalty bases for HDD shipments that contain HGA units. She first estimated Seagate's worldwide sales of HGAs during the damages period between April 29, 2010 and December 31, 2017, and constructed four "scenarios" for which she estimated the number of allegedly infringing HGAs.<sup>503</sup> For each of her estimated royalty bases, Ms. Lawton applied her assumed \$0.30 per-unit royalty to calculate damages to LMS.

- Ms. Lawton estimated that during the period April 29, 2010 through December 31, 2017, Seagate's worldwide sales of HGAs were 4.6 billion units.<sup>504</sup> Using this as a royalty base, Ms. Lawton calculated reasonable royalty damages to LMS of \$1.382 billion.<sup>505</sup>
- In what Ms. Lawton refers to as her "Scenario 1," Ms. Lawton estimated the number of HGA units sold or shipped to addresses in the U.S. during the damages period. Ms. Lawton estimated that this amounts to 1.1 billion units, equivalent to 22.8 percent of

<sup>501</sup> Shay Deposition, at 29, 38, 130-31, 152-54, 160-61.

<sup>502</sup> Shay Deposition, at 154.

<sup>503</sup> Lawton Report, Seagate Schedule A.1.

<sup>504</sup> Lawton Report, ¶¶ 1029-30. In Schedule C.1 of her report, Ms. Lawton presented an alternative calculation in which she estimated that Seagate's worldwide sales of HGAs [REDACTED] Seagate Schedule C.1

<sup>505</sup> Lawton Report, Seagate Schedule A.1. It is not clear that Ms. Lawton is actually offering an opinion that Lambeth is entitled to damages on worldwide sales of HGAs.

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- her estimate of Seagate's worldwide HGA units,<sup>506</sup> and calculated reasonable royalty damages to LMS of \$315.1 million.<sup>507</sup>
- In Ms. Lawton's "Scenario 2," she added to the volume of HGA units from Scenario 1 her estimate of Seagate's sales of HGAs outside of the U.S. to U.S.-based OEM suppliers, which she assumed to be 92.6 percent of the total volume estimated in Scenario 1.<sup>508</sup> The corresponding estimate of infringing HGA units increased to 2.0 billion units,<sup>509</sup> and Ms. Lawton's calculation of damages to LMS increased to \$606.8 million.<sup>510</sup>
  - In "Scenario 3," Ms. Lawton attempted to estimate the number of infringing HGA units based on the share of wafers fabricated in Seagate's Minnesota plant.<sup>511</sup> Ms. Lawton claimed that 30 percent of all of Seagate's wafers were fabricated in Minnesota, and that the royalty base should be equivalent to 30 percent of Seagate's worldwide HGA units (1.4 billion units).<sup>512</sup> This royalty base yielded reasonable royalty damages to LMS of \$414.7 million.<sup>513</sup>
  - In "Scenario 4,"<sup>514</sup> Ms. Lawton added to her estimate in Scenario 3 her estimate of Seagate's HGA units from wafers fabricated in Northern Ireland that were "Billed to"

<sup>506</sup> Lawton Report, ¶¶ 1031-32. In Schedule C.1 of her report, [REDACTED]

[REDACTED] Lawton Report, Seagate Schedule C.1.

<sup>507</sup> Lawton Report, Seagate Schedule A.1.

<sup>508</sup> Lawton Report, ¶¶ 1033-35.

<sup>509</sup> Lawton Report, ¶ 1035.

<sup>510</sup> Lawton Report, Seagate Schedule A.1.

<sup>511</sup> Lawton Report, ¶ 1036.

<sup>512</sup> Lawton Report, ¶ 1036.

<sup>513</sup> Lawton Report, Seagate Schedule A.1.

<sup>514</sup> "Scenario 3" appears to contain two parts; I have separated them into Scenario 3 and Scenario 4 for ease of reference.



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or “Shipped to” the U.S.<sup>515</sup> The royalty base in this scenario increased to 2.1 billion units,<sup>516</sup> and Ms. Lawton’s calculation of damages to LMS increased to \$635.3 million.<sup>517</sup>

215. The fact that Ms. Lawton offered so many estimates of royalty bases highlights the administrative difficulties of using running royalty licenses. As a result, the royalty payment would have been in the form of a lump-sum payment. Indeed, as described in more detail below, in her appendices, Ms. Lawton presented an alternative estimate of Seagate’s worldwide sales of HGAs that was almost 1 billion units (nearly 20 percent) lower than the estimate she offered in the body of her report.<sup>518</sup>

**1. Worldwide HGA Units**

216. To estimate Seagate’s worldwide HGA unit sales during the damages period, Ms. Lawton relied on two data files produced by Seagate – one which reports Seagate’s quarterly demand for HGAs to fill its downstream demand for HDDs (“HGA Demand”),<sup>519</sup> and another which contains monthly sales data on Seagate’s downstream HDD sales (“HDD Sales”).<sup>520</sup>
217. Ms. Lawton claimed to estimate Seagate’s worldwide HGA units during the damages

<sup>515</sup> Lawton Report, ¶¶ 1037-39.

<sup>516</sup> Lawton Report, ¶ 1039.

<sup>517</sup> Lawton Report, Seagate Schedule A.1.

<sup>518</sup> Calculated as 4.6 billion units – 3.7 billion units = 0.9 billion units; 0.9 billion / 4.6 billion = 19 percent. Lawton Report, Seagate Schedule C.1; Lawton Report, ¶¶ 1029-30.

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period “based on Seagate’s reported HGA Demand.”<sup>521</sup> However, according to Ms. Lawton, the HGA Demand data do not include information on “Total HGA Demand” between the third quarter of 2008 and the fourth quarter of 2012.<sup>522</sup> She, therefore, estimated Seagate’s HGA demand for the damages period for which she did not have data (April 2010 to December 2012) using the downstream HDD Sales data.<sup>523</sup> Specifically, she multiplied the number of unit sales of each HDD product sold between April 2010 and December 2012 by the number of heads contained in that product according to information provided in the HDD Sales data, assuming that each HGA contains one head.<sup>524</sup> Although she provided no further detail on her calculations of Seagate’s worldwide HGAs, it appears that she estimated that there were approximately 1.6 billion worldwide HGA unit sales for the period April 2010 through December 2012. Once added to the sum of “Internal Volume” in HGA Demand for this period of 3.0 billion units,<sup>525</sup> Ms. Lawton reported a total estimate of Seagate’s worldwide HGA sales of 4.6 billion units.<sup>526</sup>

218. However, in developing her estimate of Seagate’s allegedly infringing HGA sales, for the purpose of calculating reasonable royalty damages, it is not clear that Ms. Lawton fully accounted for the fact that Seagate purchased a substantial percentage of HGAs from TDK. In particular, in estimating the quantity of potentially infringing HGAs manufactured by Seagate during the period April 2010 through December 2012 based on Seagate’s sales of HDDs during that time period, it is not clear the extent to which Ms. Lawton accounted for

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<sup>521</sup> Lawton Report, ¶ 1029.

<sup>522</sup> Seagate’s 30(b)(6) witness, Jesse Yang, stated that Seagate did produce HGAs during this period despite the missing value in the HGA Demand data. Lawton Report, ¶ 1017.

<sup>523</sup> Lawton Report, ¶ 1027, ¶ 1029.

<sup>524</sup> Lawton Report, Seagate Schedule A.1, at footnote [1].

<sup>525</sup>

<sup>526</sup> Lawton Report, ¶¶ 1029-30.

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sales of HDDs that may have included TDK's HGAs, and therefore would not constitute infringing sales.<sup>527</sup>

219. Ms. Lawton never should have begun with the HGA Demand data in her calculations.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

220. Ms. Lawton should have begun with the HDD Sales data in the appendix of her report.<sup>530</sup> Those represent actual shipments.<sup>531</sup> Ms. Lawton calculated that Seagate's worldwide sales during the period April 29, 2010 through January 1, 2018 of HDDs incorporated 3.7 billion heads.<sup>532</sup> As there is one head per HGA,<sup>533</sup> this indicates that, had Ms. Lawton used this single dataset (HDD Sales), the starting point for her royalty base calculations would have been almost 1 billion units lower than the quantity presented by Ms. Lawton in her report.<sup>534</sup>

## 2. Scenario 1 Estimate

221. One of the royalty bases that Ms. Lawton offered is the total quantity of allegedly infringing HGA units sold or shipped to addresses in the U.S. during the period April 29, 2010 through

<sup>527</sup> As the '988 Patent is allegedly embodied in write head component of HGAs, I understand that TDK's HGAs would have been covered under the LMS-TDK license agreement.

<sup>528</sup> Conversation with Dan Floeder, July 12, 2018 ("Conversation with Floeder").

<sup>529</sup> Conversation with Floeder. *See also* Yang Deposition, at 171.

<sup>530</sup> Lawton Report, Seagate Schedule C.1.

<sup>531</sup> Conversation with Floeder.

<sup>532</sup> Lawton Report, Seagate Schedule C.1.

<sup>533</sup> Yang Deposition, at 195; Conversation with Hadley.

<sup>534</sup> [REDACTED]. Lawton Report, Seagate Schedule C.1, Lawton Report, ¶¶ 1029-30.

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December 31, 2017.<sup>535</sup> [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

222. Without the necessary data to identify HGAs or downstream HDDs that contain allegedly infringing components – [REDACTED] – it is not possible to accurately determine the quantity of unit sales that should be included in the royalty base.

**3. Scenario 2 Estimate**

223. Ms. Lawton wrote that [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]<sup>9</sup> While Ms. Lawton did not provide a reliable legal basis, factual basis, or personal experience for her opinion that HGAs manufactured and sold

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<sup>535</sup> Lawton Report, ¶ 1031.

<sup>536</sup> Lawton Report, ¶¶ 1031-32.

<sup>537</sup> Lawton Report, ¶¶ 1031-32.

<sup>538</sup> Lawton Report, Seagate Exhibit Schedule A.1.

<sup>539</sup> Lawton Report, ¶ 1034.



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outside the U.S. could still constitute infringing sales if the corporate headquarters of Seagate's customer is located in the U.S., she sought to add to the royalty base calculated in Scenario 1 the quantity of HGAs that went into HDDs that were billed or shipped to addresses outside the U.S. that were sold to U.S.-based OEMs. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED].<sup>540</sup>

224. However, data are not available in this matter to identify sales to customers outside the U.S. that are based in the U.S.<sup>541</sup> Therefore, Ms. Lawton sought to estimate sales outside the U.S. that are to U.S.-based OEMs "based on the proportion of such sales in the *Siemens AG v. Seagate* litigation."<sup>542</sup>

225. According to Ms. Lawton, in *Siemens AG v. Seagate*, "Seagate's 'Ship To' and 'Bill To' sales in the U.S. were \$12.1 billion, whereas the additional shipments to U.S. OEMs were \$11.2 billion."<sup>543</sup> Ms. Lawton then calculated the proportion of sales revenues from U.S.-based OEMs *outside the U.S.* to sales revenues on sales that were billed or shipped to the U.S. (\$11.2 billion divided by \$12.1 billion), and concluded that "Seagate's additional shipments to U.S. OEMs is approximately 92.56% of its reported 'Ship To' and 'Sold To' U.S. shipments."<sup>544</sup> Ms. Lawton then multiplied her estimate of HGA units that were billed or shipped to the U.S. from Scenario 1 by 92.56 percent, and added the result to her estimate

<sup>540</sup> Seagate's Second Supplemental Answer to Interrogatory 7, August 2, 2017, at 18-19. *See also*, Shay Deposition, at 66.

<sup>541</sup> Lawton Report, ¶ 1034 ("Seagate has not provided any information that identifies its sales to its key OEM customers including Hewlett-Packard, Dell and others.").

<sup>542</sup> Lawton Report, ¶ 1034.

<sup>543</sup> Lawton Report, ¶ 1034.

<sup>544</sup> Lawton Report, ¶ 1034.

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of 1.1 billion units to arrive at her estimate of 2.0 billion units as the royalty base for her Scenario 2.

226. Even assuming that there is a legal basis to include in the royalty base HGAs that were manufactured, ordered, paid for, shipped, and sold outside the U.S., Ms. Lawton did not provide a definition of what would constitute a “U.S.-based” OEM, nor did she provide evidence regarding the geographical location of OEMs’ purchasing decisions that would allow for the identification of such OEMs. Moreover, there are multiple flaws underlying Ms. Lawton’s royalty base for this scenario.
227. First, Ms. Lawton provided no basis for her assumption that there is a relationship between total quantities of HGAs billed or shipped to the U.S. and the total quantity of HGAs sold outside the U.S. to U.S.-based OEMs. For example, according to Ms. Lawton, if the quantity of HGAs billed or shipped to the U.S. increased by 100 units, the quantity of HGAs sold outside the U.S. to U.S.-based OEMs would increase by 93 units. However, she has not demonstrated, nor is there any evidence of, a consistent relationship between those two trends that would be applied to reliably estimate sales to U.S.-based OEMs that operate outside the U.S.
228. Second, Ms. Lawton simply assumed that the pattern in Seagate’s sales during the damages period between August 2000 and March 2008 observed in *Siemens AG v. Seagate*<sup>545</sup> prevailed in the relevant period for this case, April 29, 2010 through December 2017. Ms. Lawton failed to account for the changing dynamics of the major customers of HDDs and the decreasing role of hard drives in the downstream marketplace where HDDs are incorporated into business and consumer electronics.

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<sup>545</sup> *Siemens AG v. Seagate Technology, LLC*, Case No. 8:06-cv-00788-JVS-AN (C.D. Cal.), Dkt. 780 (Trial Transcript, December 5, 2008): 38:7-20.

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229. HDDs have become less dependent on the PC marketplace over time. Desktop HDD shipments have been declining since 2000, while external HDDs and consumer electronics have been on the rise. Prior to 2002, desktop HDD shipments accounted for 75 percent of all HDD shipments, but shrank to approximately 53 percent of shipments by Q2 2006.<sup>546</sup> Consumer electronics and external HDDs, neither of which commanded a significant portion of overall shipments prior to 2000, had grown to approximately 15 percent and 5 percent respectively by 2005,<sup>547</sup> and continued to grow in subsequent years.<sup>548</sup> Thus, the relative importance of particular segments to the overall HDD marketplace has evolved since 2000.
230. Furthermore, Ms. Lawton's assumption failed to account for the increasingly important role of non-U.S.-based OEMs in the PC marketplace. For example, in the damages period of 2000 through 2008 in *Siemens AG v. Seagate*, Lenovo, a PC maker based in China, never accounted for more than 8 percent of the worldwide PC business.<sup>549</sup> By 2017, Lenovo accounted for more than 20 percent of global PC shipments.<sup>550</sup> Similarly, Acer and Asus, two Taiwan-based PC makers, contributed only 5 percent, combined, of the world's PC shipments in 2005.<sup>551</sup> Their joint share peaked in 2010 at almost 20 percent of the world's PC business and consistently occupied almost 15 percent of the world's PC shipment ever since.<sup>552</sup>
231. As a major downstream application of HDDs, the recent dynamics in the PC business offer

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<sup>546</sup> "The Hard Disk Drive Industry Overview," A.G. Edwards Analyst Report, August 21, 2006, at 2.

<sup>547</sup> "The Hard Disk Drive Industry Overview," A.G. Edwards Analyst Report, August 21, 2006, at 6.

<sup>548</sup> Rob Cihra and Edison Yu, "Seagate Technology," Sterne Agee CRT, September 28, 2015, at 14.

<sup>549</sup> Tab 11.

<sup>550</sup> Tab 11. *See also*, <https://www3.lenovo.com/us/en/lenovo/company-history/> (accessed July 10, 2018).

<sup>551</sup> Tab 11.

<sup>552</sup> Tab 11. *See also*, <https://www.acer-group.com/ag/en/TW/content/history> (accessed July 10, 2018) and [https://www.asus.com/About\\_ASUS/Company-Introduction](https://www.asus.com/About_ASUS/Company-Introduction) (accessed June 23, 2018).

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no support for Ms. Lawton's assumption that the relationship, if any, between sales that were shipped or billed to the U.S. and sales to U.S.-based OEMs outside the U.S. that had existed in the 2000s would have remained constant over time. This methodology and assumption is unreliable and serves to improperly inflate her royalty base estimates.

#### 4. Scenario 3 and Scenario 4 Estimates

232. In her Scenario 3, Ms. Lawton attempted to identify the share of Seagate's worldwide HGA units "that were made from wafers fabbed at Seagate's wafer fabrication facility in Minnesota versus wafers that were fabbed at Seagate's wafer fabrication facility in Northern Ireland."<sup>553</sup> To this end, Ms. Lawton used "a spreadsheet (SEA03336805) that summarizes [Seagate's] wafer level slider shipment by calendar year" and claimed that "Seagate has not provided information that would enable [her] to correlate slider shipments to products."<sup>554</sup> As a result, Ms. Lawton claimed that she "conservatively estimated 30% of all wafer level slider shipments to be from the Minnesota location each year."<sup>555</sup> Ms. Lawton then applied this 30 percent to her estimate of Seagate's worldwide HGA units of 4.6 billion to arrive at an estimate of 1.4 billion units.<sup>556</sup>
233. In her Scenario 4, Ms. Lawton attempted to add the HGAs that contain "sliders manufactured in Northern Ireland that are shipped into the U.S" on to her estimated quantity of HGAs that include wafer level sliders that originated from Seagate's Minnesota plant (from Scenario 3).<sup>557</sup> [REDACTED]

[REDACTED] Ms. Lawton "assumes that a pro rata proportion HGAs from wafers fabbed in

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<sup>553</sup> Lawton Report, ¶ 1018.

<sup>554</sup> Lawton Report, ¶ 1018.

<sup>555</sup> Lawton Report, Seagate Schedule A.1, at footnote [5].

<sup>556</sup> Lawton Report, ¶ 1036.

<sup>557</sup> Lawton Report, ¶ 1037.

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Northern Ireland would ship into the U.S.”<sup>558</sup> Ms. Lawton multiplied her estimate of 70 percent of Seagate’s HGAs that contain sliders manufactured from wafers that originated in Northern Ireland (from Scenario 3) by the 22.8 percent of Seagate’s worldwide HGA sales that she estimated are billed or shipped to the U.S. (from her Scenario 1).<sup>559</sup> The resulting estimate (0.7 billion HGAs) was then added to the royalty base calculated in Scenario 3 to arrive at her estimate of 2.1 billion units for her Scenario 4.<sup>560</sup>

234. As Ms. Lawton’s estimated royalty bases in Scenarios 3 and 4 are calculated using her estimate of Seagate’s worldwide sales of HGAs, which is highly sensitive to the dataset that she uses, neither estimate provides a reliable royalty base.
235. Moreover, in her Scenario 4 estimate, Ms. Lawton provided no basis for her assumption that sliders originating in Ireland are equally as likely as wafers originating in Minnesota to end up in an HGA sold to the U.S. It is possible that a larger proportion of U.S.-destined HGAs were manufactured in the Minnesota plant, and would therefore be subsumed in her estimate from Scenario 3.
236. To test Ms. Lawton’s assumption that 30 percent of all products are likely to contain a wafer level slider that originated in Minnesota, I examined the share of wafer level sliders that originated in each of Seagate’s wafer plants by HDD product. Based on these data, I found no evidence supporting Ms. Lawton’s assumption that wafer level sliders that originated from Seagate’s Minnesota plant have the same probability of going into all HDDs. Among the 56 internal product names identified in the wafer level slider data, [REDACTED]
- [REDACTED]

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<sup>558</sup> Lawton Report, ¶ 1038.

<sup>559</sup> Lawton Report, ¶¶ 1037-39.

<sup>560</sup> Lawton Report, ¶ 1039; Lawton Report, Seagate Schedule A.1.

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

237. Ms. Lawton's assumption that there is no relationship between the source of a wafer and the ultimate destination of the HGA/HDD in which the wafer was a component is therefore not supported by the data, and could substantially overstate the royalty base.

### 5. Summary

238. As described above, Ms. Lawton has not provided a reliable basis to determine the number of infringing products. While this fact alone would support the use of a lump-sum royalty, Ms. Lawton sought to estimate a variety of potential royalty bases based on unfounded assumptions, including the unit basis for the calculation of a royalty base. Ultimately, in addition to the fact that she began her analysis with the wrong data set (HGA Demand), each of her assumptions and calculations suffer from methodological and conceptual flaws that renders the quantities unreliable and leads to a substantial overstatement of any reasonable measure of damages.<sup>563</sup>

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<sup>561</sup> Tab 16.

<sup>562</sup> Tab 16.

<sup>563</sup> As context for Ms. Lawton's asserted "reasonable" royalty damages estimates ranging from \$220.6 million to \$606.8 million, it is important to note that Seagate paid approximately \$1.4 billion in 2011 to acquire Samsung's entire HDD business, including "assets, infrastructure and employees which enable Seagate to drive scale and innovation ... [and] Samsung's leading M8 product line of high-capacity, 2.5-inch HDDs." Those assets included certain tangible assets, such as plants and equipment, and inventory used exclusively in the HDD business and operations, as well as certain patents, trademarks, technology, and other IP related to Samsung's HDD business. Ms. Lawton's damages calculations would, therefore, suggest that the value of the '988 Patent, a single patent that is directed to a single subcomponent of a technologically complex and multi-component product, is equivalent to one-sixth to nearly one-half (16 percent to 43 percent) of the value of Samsung's entire HDD business. SEA02238209-81, at 15, 69, 80, 81; "Seagate Completes Acquisition of Samsung's Hard Disk Drive Business," available at <https://www.seagate.com/about-seagate/news/seagate-completes-aquisition-samsungs-hdd-business-pr/> (accessed June 14, 2018).

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**V. JAROSZ ANALYSIS**

**A. Overview**

239. To estimate a reasonable royalty, I typically employ a two-part analysis. First, I consider three quantitative methodologies that are commonly used by economists to value any type of asset (in this case, an intangible asset). These methodologies are the Licensing Comparables (or Market) Approach, the Incremental Benefits (or Income) Approach, and the Design-Around (or Cost) Approach.<sup>564</sup> These methodologies are the means by which I allocate or apportion the value associated with the patent-in-suit, as opposed to other product or service value contributors. They provide methods by which a proper price can be determined for the economic footprint of a patented technology.
240. The above typically provides a range of potential royalties or payments that would provide adequate compensation to the patent holder for the unauthorized use of the patents-in-suit. Because of that, I then consider a variety of qualitative factors, based largely on the fifteen factors identified in *Georgia-Pacific*.<sup>565</sup> From this analysis, I determine the appropriate amount of reasonable royalty damages that should be paid in the event that the patent-in-suit is found to be valid, enforceable, and infringed.

**1. Form of License**

241. For most real-world licenses and reasonable royalty damages awards, compensation is provided by one or both of a lump-sum payment and a running royalty fixed to product

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<sup>564</sup> See, e.g., Shannon P. Pratt, Robert F. Reilly and Robert P. Schweihs, Valuing a Business: The Analysis and Appraisal of Closely Held Companies, 151-258 (McGraw Hill 2000); Gordon V. Smith and Russell L. Parr, Valuation of Intellectual Property and Intangible Assets, 151-73 (John Wiley & Sons 2000); Robert F. Reilly and Robert P. Schweihs, Valuing Intangible Assets, 95-202 (McGraw-Hill 1999); John C. Jarosz and Michael J. Chapman, “The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog,” 16 *Stanford Technology Law Review* 769 (Spring 2013).

<sup>565</sup> *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971).

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manufacture or shipment or sales. A lump-sum royalty payment typically involves a one-time payment whose magnitude may not be directly (or precisely) tied to the extent of alleged usage of the technology at issue by the alleged infringer. Rather, the magnitude of the payment can be somewhat invariant to the level of infringing activity because the corresponding (actual or hypothetical) license simply provides the (actual or hypothetical) licensee with permission to use the technology at issue.

242. Some of the perceived implications of a lump-sum damages award have been described by the Federal Circuit:

A lump-sum license “benefits the patent holder in that it enables the company to raise a substantial amount of cash quickly and benefits the target [i.e., the licensee] by capping its liability and giving it the ability, usually for the remainder of the patent term, to actually use the patented technology in its own products without any further expenditure.” The lump-sum license removes or shifts certain risks inherent in most arms-length agreements. ... [A]n upfront, paid-in-full royalty removes, as an option for the licensee, the ability to reevaluate the usefulness, and thus the value, of the patented technology as it is used and/or sold by the licensee. ... A licensee to a lump-sum agreement, under usual licensing terms, cannot later ask for a refund from the licensor based on a subsequent decision not to use the patented technology. There is no provision for buyer’s remorse.

The lump-sum structure also creates risks for both parties. The licensed technology may be wildly successful, and the licensee may have acquired the technology for far less than what later proved to be its economic value. The alternative risk, of course, is the licensee may have paid a lump-sum far in excess of what the patented invention is later shown to be worth in the marketplace.<sup>566</sup>

243. In contrast, a running royalty, distributes risk in a different fashion. The Federal Circuit has described a running royalty license:

In a standard running royalty license, the amount of money payable by the licensee to the patentee is tied directly to how often the licensed invention is later used or incorporated into products by the licensee. A running royalty structure shifts many licensing risks to the licensor because he does not

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<sup>566</sup> *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1326 (Fed. Cir. 2009).



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receive a guaranteed payment. Royalties are dependent on the level of sales or usage by the licensee, which the licensee can often control.<sup>567</sup>

244. In any given patent infringement proceeding, the appropriate form of the reasonable royalty depends on the specific facts and circumstances of the case. Relevant considerations include the licensing practices of the patent holder, the alleged infringer, and the relevant industry, the bargaining power of the parties, the type of product involved, the nature of the benefits provided by the patented technology, and administrative burdens.

## 2. Quantitative Considerations

### a. Market Approach

245. With the Market Approach, an appropriate price for the use of the patent(s)-at-issue is identified through the examination of the terms of transfers of rights (*e.g.*, licenses) involving similar technology rights. Inferences are drawn from those transactions to identify terms to which prudent parties would (or should) agree to in a hypothetical negotiation in order to permit the alleged infringer to practice the patent-at-issue.<sup>568</sup> In applying the Market Approach, the closer the “other” transactions are in comparability to the hypothetical transaction under consideration, the more useful the information.
246. Past licenses or transactions can differ from a hypothetical transaction in many ways:
- parties to the transaction;
  - time of transaction;
  - nature and scope of the asset/IP transferred (*e.g.*, number of patents, transfer of know-how);
  - product or service that uses the IP;

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<sup>567</sup> *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1326 (Fed. Cir. 2009).

<sup>568</sup> If I intend to sell my home over the next year and am seeking to determine a fair price, the Market Approach suggests that I (or my real estate agent) gather information on other home sales in my neighborhood in the recent past. If four homes have sold for \$200,000 in the past year, that piece of information provides strong *a priori* evidence that my home should be priced at roughly \$200,000, with some adjustments upward or downward depending on the characteristics of the houses compared to mine.

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- existing and projected market conditions at the time of the transaction;
- strength of the asset/IP transferred;
- availability and costs of design-around; and
- relative bargaining strength of the parties.

247. In using the Market Approach, holding all else constant, the most useful and informative transactions and proposed transactions are those that cover the technology-at-issue or something reasonably close; those that cover the product or service, or something reasonably close; and those that involve the parties-in-suit. Other observations unrelated to the patent-in-suit or parties-in-suit may be associated with a variety of different elements of value and may be of less guidance as to the outcome of the hypothetical negotiation.

**b. Cost Approach**

248. In general, the Cost Approach attempts to measure costs that would be incurred to avoid infringement of the patent.<sup>569</sup> According to the Cost Approach, a user of certain patented technology would pay no more for access to that technology than its avoided costs.<sup>570</sup> These costs might include both accounting costs, such as developing an alternative approach that does not infringe the patent, and economic costs, such as the loss of market demand associated with removal of a patented feature.

**c. Income Approach**

249. An Income Approach analysis seeks to identify the gains enjoyed by the infringer attributable to the use of the patent. In particular, it calls for an evaluation of the benefits

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<sup>569</sup> Reilly and Schweihs (1999), at 97.

<sup>570</sup> The use of the Cost Approach for establishing an upper-bound on damages was recognized by the Federal Circuit in *Grain Processing. Grain Processing v. American Maize-Products Co.*, 185 F.3d 1341, 1347 (Fed. Cir. 1999). *See also*, Christopher B. Seaman, "Reconsidering the Georgia-Pacific Standard for Reasonable Royalty Patent Damages," 2010 *BYU Law Review*, No. 5, at 1661 (available at <http://ssrn.com/abstract=1575805>).

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of practicing the patent versus the benefits of practicing the next-best alternative.

250. Incremental benefits can take a number of forms. Use of the patented technology may allow the infringer to charge higher prices, generate higher sales volume, or incur lower costs than it otherwise would have absent that use.<sup>571</sup> In short, the Income Approach seeks to examine the added profits realized by the infringer from the use of the patented technology.<sup>572</sup>
251. One method that is sometimes used to divide the profits from products incorporating the patented technology between the patent owner and the alleged infringer is the Analytical Approach. This approach examines the profits on products incorporating the patented technology and the profits on a product that is otherwise identical, but does not utilize the patented technology.<sup>573</sup> Any profits generated on products utilizing the patented technology that are in excess of the profits on the benchmark product reflect an amount that may be due to the patented technology.

### **3. Qualitative Considerations**

252. After considering quantitative evidence, I typically evaluate that evidence in light of qualitative considerations. For the most part, those considerations are the factors identified in the *Georgia-Pacific* case. They provide useful guidance on where within the range under consideration a reasonable royalty should lie.

#### **B. Form of the Hypothetical License**

253. To determine the form of the royalty payment that would have resulted here from the

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<sup>571</sup> John C. Jarosz and Michael J. Chapman, “The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog,” 16 *Stanford Technology Law Review* 769 (Spring 2013), at 813.

<sup>572</sup> John C. Jarosz and Michael J. Chapman, “The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog,” 16 *Stanford Technology Law Review* 769 (Spring 2013), at 813.

<sup>573</sup> This method was endorsed by the Federal Circuit in *TWM Manufacturing Co., Inc. v. Dura Corp. and Kidde, Inc.*, 789 F.2d 895 (Fed. Cir. 1986).

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hypothetical negotiation, I first assessed the agreements that have been produced in this matter that (1) pertain to technologies used in the HDD industry; (2) consist of one-way licenses, as opposed to cross-licenses; and (3) included transfers that granted access to patents only, as opposed to product licenses.

254. Of the 65 agreements produced by Seagate in this matter,<sup>574</sup> 14 are one-way patent licenses and pertain to HDD-related technologies.<sup>575</sup> Of the 13 agreements for which information on royalty payments are available,<sup>576</sup> 12 called for only lump-sum royalty payments.<sup>577</sup> The one that did include a running royalty included a cap on the number of royalty bearing units, which effectively translates into a lump-sum agreement.<sup>578</sup>

255. In addition to industry licensing practices, the difficulty in tracking the benefits of the alleged invention suggests use here of a lump-sum royalty compensation structure. As discussed above, given that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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<sup>574</sup> Tab 6.

<sup>575</sup> Tab 7.

<sup>576</sup> Information regarding the royalty payment associated with the agreement with Dr. James White was not available because it was specified in a confidential settlement agreement. Tab 7.

<sup>577</sup> Tab 7.

<sup>578</sup> Among the seven agreements that did not result from litigation or accompany patent sales, six agreements called for only lump-sum royalties. As explained above, the one that did not call for lump-sum royalties includes a running royalty with a cap on the number of royalty bearing units, which effectively translates into a lump-sum agreement. Tab 7.

<sup>579</sup> Shay Deposition, at 154.

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[REDACTED]

[REDACTED]

256. In fact, the two negotiated licenses covering the '988 Patent – the license negotiated between Acacia and Samsung, and the license negotiated between LMS and TDK – both [REDACTED].<sup>580</sup>

257. In light of the foregoing, the royalty that likely would have resulted from the hypothetical negotiation for access to the '988 Patent would have been in the form of a lump-sum payment.

**C. Market Approach**

258. To determine the royalty that should be paid for a license to the '988 Patent, I first reviewed evidence regarding previous valuations of the '988 Patent. I then sought to identify and assess the value of one-way patent-only license agreements that pertain to somewhat comparable technologies, including both agreements produced by Seagate and other industry licenses available in this matter. In doing so, I considered Ms. Lawton's commentary on those agreements to determine whether and the extent to which they may inform the reasonable royalty that would have resulted from the hypothetical negotiation.

**1. '988 Patent**

259. As described above, the '988 Patent has been included in several previous assignments, license and settlement agreements, option agreements, and valuations.

**a. Acacia-Samsung License**

260. Effective as of March 2, 2011, Acacia and Samsung entered into a license agreement for [REDACTED]

[REDACTED]

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<sup>580</sup> ARC003093-189 at ARC0003095, ¶2.1; LAMBETH-000222078-98 at LAMBETH-000222083 and 85.

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[REDACTED]<sup>81</sup> At the time, Samsung was one of the major HDD suppliers in the world.<sup>582</sup> In return, [REDACTED]

261. Ms. Lawton claimed that Acacia's [REDACTED] allocation of value to the '988 Patent "does not represent a 'valuation' of the '988 Patent" for a number of reasons.<sup>586</sup> Her reasoning and conclusions are flawed.

262. Ms. Lawton claimed that the [REDACTED] allocation of value to the '988 Patent is substantially less than the preliminary damages estimate that Acacia had prepared.<sup>587</sup> But Acacia's preliminary damages estimate was just that, an estimate. In a real-world negotiation, Acacia (a party that Dr. Lambeth admitted had more experience and bargaining power than himself<sup>588</sup>) negotiated with Samsung (a HDD manufacturer) and the result was a [REDACTED]

██████████ In connection with that real-world negotiation, Acacia allocated ██████████ of the license to the value of the '988 patent. As noted above, in describing the damages estimate and the inputs used, Acacia's 30(b)(6) witness, Mr. Mitchell, explained that "[y]ou don't know that until you get discovery and you find out these sort of things."<sup>589</sup> Referring

581 ARC003093-189.

<sup>582</sup> “Seagate Completes Acquisition of Samsung’s Hard Disk Drive Business,” available at <https://www.seagate.com/about-seagate/news/seagate-completes-aquisition-samsungs-hdd-business-pr/> (accessed June 14, 2018). *See also*, Tab 4.

583 ARC003093-189 at ARC0003095, ¶ 2.1.

584 Mitchell Deposition, at 45.

585 Mitchell Deposition, at 68.

586 Lawton Report, ¶ 143.

587 Lawton Report, ¶ 143(a).

588 Lambeth 02/26 Deposition, at 301-02.

<sup>589</sup> Mitchell Deposition, at 207-08 (emphasis added).

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specifically to the [REDACTED] royalty rate used in the damages estimate, Mr. Mitchell explained that “[y]ou rarely ever get this type of number.”<sup>590</sup> There is no evidence that the damages estimate ultimately contributed to the license agreement that was *actually negotiated* with Samsung. Further, as the then-owner of the ‘988 Patent, Acacia had an economic incentive to extract the highest possible value from the license with Samsung. The fact that it was not able to achieve the royalty fees estimated in its preliminary damages model demonstrates that its estimation did not reflect the true market value of the ‘988 Patent that it may have, at one time, hoped for.

263. Further, Ms. Lawton wrote that Acacia violated the terms of its contract with LS by bundling the license to the ‘988 Patent with other patents, which created the need for Acacia to make allocations between various patents.<sup>591</sup> She also claimed that Acacia did not provide all of the records associated with the allocation of [REDACTED] to Dr. Lambeth,<sup>592</sup> and that because Mr. Mitchell was not involved in the negotiations with Samsung or the allocation of value to the ‘988 Patent, he could not confirm the reasonableness of the allocated value.<sup>593</sup>

264. As an initial matter, Acacia’s allocation of value to the ‘988 Patent is not obviously low or unreasonable. In fact, it reflects more than 6 percent of the value of the entire portfolio of patents,<sup>594</sup> suggesting that it is within the top 15 most valuable patents included in the

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<sup>590</sup> Mitchell Deposition, at 207-08 (emphasis added).

<sup>591</sup> Lawton Report, ¶ 143(b).

<sup>592</sup> Lawton Report, ¶ 143(c).

<sup>593</sup> Lawton Report, ¶ 143(d).

<sup>594</sup> Calculated as \$3 million / \$45 million = 6.67 percent.



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license,<sup>595</sup> which covered over 1,000 patents.<sup>596</sup>

265. The terms of the settlement agreement between LS and Acacia may be, in fact, informative as to the value that Dr. Lambeth believed should have been allocated to the '988 Patent and its foreign equivalents. As described above, after [REDACTED], Dr. Lambeth sued Acacia for breaching the contract between LS and Acacia.<sup>597</sup> Dr. Lambeth also alleged that Acacia allocated "an improperly low amount" to the '988 Patent and its foreign equivalents, that Acacia should not have withheld Korean taxes from the monies paid to LS, and that Acacia owed LS compensation pursuant to a consulting agreement.<sup>598</sup> The parties subsequently entered into a settlement agreement, pursuant to which [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]<sup>599</sup>
266. The fact that Dr. Lambeth was willing to settle the litigation in return for a [REDACTED] payment suggests that he might have been willing to license the '988 Patent and foreign equivalents to Samsung had he received a total of [REDACTED]<sup>600</sup> If this amount had reflected [REDACTED] it

<sup>595</sup> The value allocated to the '988 Patent is one-fifteenth of the total compensation paid by Samsung (\$45 million / \$3 million = 15). If the top 15 most valuable patents were allocated a value of \$3 million each, all other patents would have a value of zero.

<sup>596</sup> Even if 100 percent of the value of the Acacia-Samsung license were allocated to the '988 Patent and its foreign equivalents (\$45 million), that value would be a small fraction of Ms. Lawton's estimated royalties in this matter of \$220.6 million to \$606.8 million. ARC0003093-189 at ARC0003095, ¶ 2.1; Lawton Report, Seagate Schedule A.1.

<sup>597</sup> LAMBETH-000224014-31 at LAMBETH-000224014.

<sup>598</sup> LAMBETH-000224014-31 at LAMBETH-000224014.

<sup>599</sup> LAMBETH-000224014-31 at LAMBETH-000224015, 17-18.

<sup>600</sup> [REDACTED]



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suggests that Dr. Lambeth valued the '988 Patent and foreign equivalents at an amount slightly less than \$4 million.<sup>601</sup> As the [REDACTED]

[REDACTED] the settlement amount may indicate that Dr. Lambeth valued the '988 Patent and its foreign equivalents at much less than \$4 million.

267. Ms. Lawton wrote that the Acacia-Samsung agreement was based on limited information because it occurred prior to any discovery and may have been "discounted."<sup>602</sup> The fact that there was limited information does not necessarily bias the number downward, and Ms. Lawton has not shown that to be the case. In fact, the settlement amount could very well be an overestimate of the value of the patent.

268. The Acacia-Samsung negotiation and the subsequent allocation and settlement amount suggest that the appropriate value of the '988 Patent (and its foreign equivalents) resulting from the Samsung agreement may be up to \$4 million.

**b. LMS's and Dr. Lambeth's Valuation**

269. Subsequent to the reassignment of the '988 Patent and its foreign equivalents to LS and the assignment of the patents to LMS, LMS reported to the U.S. Internal Revenue Service ("IRS") that the total value of LMS was \$463,000.<sup>603</sup> As LMS's assets consisted only of patents, this amount is, in essence, a valuation of all of its patents. At that point, the '988 Patent was only part of that portfolio.

270. In addition, Dr. Lambeth and his wife each filed U.S. Gift Tax Returns with the IRS for

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<sup>601</sup> [REDACTED].

<sup>602</sup> Lawton Report, ¶ 143(f)..

<sup>603</sup> Lambeth 02/26 Deposition, at 83-88; LAMBETH-000310374; LAMBETH-000310375-79; LAMBETH-000310380-84; and LAMBETH-000310385-96.

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calendar year 2014 reflecting the value of the 15-percent ownership shares in LMS that were gifted to each of Dr. Lambeth's children.<sup>604</sup> According to the U.S. Gift Tax Returns, the value of the 15-percent ownership shares that were gifted to each of his children amounted to \$69,450, which supports a total value of LMS of \$463,000.<sup>605</sup> I understand that, according to the IRS Instructions for Gift Tax Returns (Form 709), "[t]he value of a gift is the fair market value (FMV) of the property on the date the gift is made (valuation date). The FMV is the price at which the property would change hands between a willing buyer and a willing seller, when neither is forced to buy or to sell, and when both have reasonable knowledge of all relevant facts."<sup>606</sup> By 2009 or 2010, Dr. Lambeth believed that Seagate was infringing the '988 Patent.<sup>607</sup>

271. The fact that Dr. Lambeth filed tax documents with the IRS in which he essentially stated under penalty of perjury that the total fair market value of LMS – the only assets of which are the '988 Patent and foreign counterparts – was \$463,000 is consistent with my opinion and that Ms. Lawton significantly overvalued the '988 Patent.

**c. TDK Settlement and License**

272. As described above, LMS sued TDK for alleged infringement of the '988 Patent, and entered into an agreement on March 30, 2017, after TDK had been dismissed from the case, that included granting TDK a license to the '988 Patent and its foreign equivalents.<sup>608</sup>
273. Ms. Lawton wrote that the LMS-TDK agreement "is not a relevant benchmark for establishing a reasonable royalty for Seagate's use of the claimed invention of the '988

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<sup>604</sup> LAMBETH-000310374; LAMBETH-000310375-79; LAMBETH-000310380-84.

<sup>605</sup> Calculated as  $\$69,450/0.15 = \$463,000$ .

<sup>606</sup> <https://www.irs.gov/pub/irs-pdf/i709.pdf> (accessed July 11, 2018).

<sup>607</sup> Lambeth 02/26 Deposition, at 66.

<sup>608</sup> LAMBETH-000222078-98 at LAMBETH-000222083 and 85.

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Patent in this case” for several reasons.<sup>609</sup>

274. First, she wrote that the LMS-TDK agreement was negotiated before the litigation was sufficiently far along. She noted that the litigation had been on-going for a period of more than two years (since November 6, 2014), but wrote that only limited discovery had occurred prior to the date of settlement.<sup>610</sup>
275. As an initial matter, LMS commenced litigation against Toshiba Corporation on November 6, 2014 and against TDK and related parties on June 24, 2016.<sup>611</sup> Thereafter, defendants SAE Magnetics H.K. Ltd., Headway Technologies, Inc. and TDK all moved to dismiss the Third Amended Complaint for lack of personal jurisdiction, and the court granted their motion dismissing them from the case with prejudice on March 1, 2017.<sup>612</sup> Accordingly, on the date of the LMS/TDK agreement, March 30, 2017, there was no litigation between the parties – TDK had been dismissed with prejudice. Further, estimates of TDK/Headway head shipments were available to the parties, which Ms. Lawton herself has relied upon as reasonable and reliable.<sup>613</sup> In addition, while the extent of information produced in a case regarding the likelihood of infringement may inform the ultimate settlement amount, it does not necessarily indicate that the ultimate settlement amount is completely irrelevant. Further, there is no evidence in this case that the stage of litigation (or lack thereof) biased the result downward, and Ms. Lawton has not shown that to be the case.
276. Second, Ms. Lawton wrote that, unlike Seagate, TDK did not have substantial wafer

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<sup>609</sup> Lawton Report, ¶ 963.

<sup>610</sup> Lawton Report, ¶ 963(a).

<sup>611</sup> *Lambeth Magnetic Structures, LLC v. Toshiba Corporation, et al.*, Civ. No. 2:14-cv-01526-CB (W.D. Pa.), Dkt. Nos. 1, 82.

<sup>612</sup> *Lambeth Magnetic Structures, LLC v. Toshiba Corporation, et al.*, Civ. No. 2:14-cv-01526-CB (W.D. Pa.), Dkt. No. 172.

<sup>613</sup> Lawton Report, ¶ 973.

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manufacturing operations in the U.S.<sup>614</sup> Given that the LMS-TDK agreement included [REDACTED] it is not clear why the geographic location of TDK's wafer production facilities would influence the relative value of the underlying technology. To the extent that TDK's products would have allegedly infringed the foreign equivalents versus the '988 Patent itself, then it would simply reflect a different distribution of value within the portfolio of patents to which TDK was granted access through the agreement.

277. Third, Ms. Lawton posited that the agreement is not relevant because TDK and Seagate compete at different levels in the supply chain, and realize different benefits associated with their alleged use of the '988 Patent.<sup>615</sup> While Seagate may be more vertically integrated than TDK, there is substantial overlap in their competition. Seagate purchases HGAs from subsidiaries at arm's-length prices, as well as from TDK. To the extent Seagate could not manufacture HGAs of similar quality at a similar cost/price as TDK, it would be economically rational for Seagate to purchase all of its HGAs from TDK. As the '988 Patent is not embodied in HDDs outside of the write head, then there is no reason that Seagate's vertically integrated production strategy would result in substantially different valuations of the '988 Patent.

278. Fourth, Ms. Lawton asserted that the LMS-TDK agreement "was negotiated under the overhang of long-running and ongoing mass infringement" by other HDD manufacturers that challenged the validity and infringement of the '988 Patent.<sup>616</sup> Ms. Lawton did not explain why or how this would bias the results downward.

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<sup>614</sup> Lawton Report, ¶ 963(b).

<sup>615</sup> Lawton Report, ¶ 963(c).

<sup>616</sup> Lawton Report, ¶ 963(d).

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279. Finally, Ms. Lawton argued that the LMS-TDK agreement was negotiated more than a decade after the date of the hypothetical negotiation here.<sup>617</sup> I understand that the LMS-TDK agreement amount [REDACTED]
- [REDACTED] Further, it is not clear how the timing of the agreement biases the results. In fact, by Ms. Lawton's own logic, a payment later in time may be biased upward because the licensee and industry are more committed to PMR technology than they would have been earlier in time.
280. Ms. Lawton failed to grasp the significance of the fact that the LMS-TDK agreement included [REDACTED]. As described above, while I disagree with Ms. Lawton's conclusion that there is an "effective per-unit royalty" attributable to the LMS-TDK license (for which TDK paid an upfront, lump-sum royalty sum that was not contingent on the quantity of units sold), I corrected her calculation to account for the fact that the hypothetical license would only pertain to sales that allegedly infringed on the '988 Patent. While the various royalty bases that Ms. Lawton offered are flawed for the reasons identified above, when applied to the corrected effective per-unit royalty, I calculate a nominal royalty range of \$5.1 to \$10.2 million.<sup>620</sup> Based on Ms. Lawton's estimated HDD head shipments as the royalty base using HDD Sales data rather than HGA Demand data as the starting point, I calculated a nominal royalty \$4.1 million.<sup>621</sup>

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<sup>617</sup> Lawton Report, ¶ 963(e).

<sup>618</sup> LAMBETH-000222078-098, at LAMBETH-000222085. TDK launched its first PMR product in 2005. [https://www.global.tdk.com/corp/en/about\\_tdk/our\\_history/index.htm](https://www.global.tdk.com/corp/en/about_tdk/our_history/index.htm) (accessed July 11, 2018).

<sup>619</sup> LAMBETH-000222078-098, at LAMBETH-000222090.

<sup>620</sup> Tab 9.

<sup>621</sup> Tab 9. Ms. Lawton only provided one scenario in estimating the royalty based based on HDD head shipments. She estimated the total number of infringing heads to be 853 million units for the damages period between April 2010 and December 2017. Lawton Report, Seagate Schedule C.1.

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## 2. Other IP

281. As noted above, I reviewed the agreements produced by Seagate in this matter in which Seagate is a licensee, and which covered one-way patent licenses to HDD-related technologies.<sup>622</sup> Among the 13 licenses for which royalty payment information is available, the median license fee is [REDACTED].<sup>623</sup> Based on available information, these agreements collectively cover at least 304 patents.<sup>624</sup>
282. In this section, I assess those other agreements that, according to Dr. Eric Fullerton, grant licenses to patents that are technologically similar to the '988 Patent.

### a. Jülich License

283. In July 1997, Seagate entered into an agreement with Forschungszentrum Jülich ("Jülich") for a non-exclusive, worldwide license to U.S. Patent No. 4,949,039 (the "'039 Patent" or "Grünberg patent") and its foreign counterparts.<sup>625</sup> In exchange for the patent license, Seagate agreed to pay a lump sum fee of \$1,200,000 to Jülich as consideration.<sup>626</sup>
284. As explained above, the GMR technology conveyed through the '039 patent was recognized as a ground-breaking contribution, and its inventors Albert Fert and Peter Grünberg, were awarded the Nobel Prize in Physics in 2007 for that contribution.<sup>627</sup> In its publication of the Prize, The Royal Swedish Academy of Sciences described the discovery of GMR as "hav[ing] revolutionized techniques for retrieving data from hard disks."<sup>628</sup> In

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<sup>622</sup> Tab 7.

<sup>623</sup> Among the seven agreements that covered one-way patent licenses and were not associated with a settlement or patent sale, the median license fee is [REDACTED] and the [REDACTED]. Four licenses clearly identify the number of patents covered, which range from four to 33 patents, covering a total of 77 patents in total among the four licenses. Tabs 7 and 8.

<sup>624</sup> Tab 8.

<sup>625</sup> SEA00183921-27.

<sup>626</sup> SEA00183921-27, at 924.

<sup>627</sup> The Nobel Committee's explanation for presenting the Nobel Prize to Messrs. Fert and Grünberg was presented in <https://www.youtube.com/watch?v=dVpi0-uqtDA>

<sup>628</sup> [https://www.nobelprize.org/nobel\\_prizes/physics/laureates/2007/popular-physicsprize2007.pdf](https://www.nobelprize.org/nobel_prizes/physics/laureates/2007/popular-physicsprize2007.pdf) (accessed June

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contrast, according to Ms. Lawton, “[t]o date, neither the claimed invention of the ‘988 Patent, nor Dr. Lambeth for his invention of the ‘988, have not [*sic*] been the subject of any award or prize.”<sup>629</sup>

285. According to Dr. Fullerton, “the ‘039 Patent covers the foundational elements (*i.e.*, a nonmagnetic layer positioned between two magnetic layers) of GMR sensors for read heads in HDDs,” and “the GMR technology claimed by the ‘039 Patent resulted in significant improvements in areal density.”<sup>630</sup> He concluded that “the ‘039 Patent relates to technology that is comparable to the ‘988 Patent, to the extent that both (i) are generally directed to HDDs and other magnetic storage devices; (ii) are directed to thin-film subcomponents in HDDs; (iii) are focused on a key sub-component in an HDD, the read/write head; (iv) involve thin-film magnetic structures that purportedly can be used in the read/write head of an HDD; and (v) are intended to increase areal density for data storage in HDDs.”<sup>631</sup>

286. However, Dr. Fullerton also determined that, in contrast to the ‘039 Patent, “the purported invention of the ‘988 Patent at most had an incremental effect in improving uniaxial anisotropy in write heads, not a fundamental shift like GMR ... and uniaxial anisotropy could be derived from multiple other prior art sources, including from shape, pair ordering, and strain.”<sup>632</sup> He further wrote that, “in stark contrast to the voluminous quantity of research, papers, and industry focus following the grant of the Grünberg patent, to my knowledge there have been no papers, research, or interest following the publishing of the

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23, 2018).

<sup>629</sup> Lawton Report, ¶ 48.

<sup>630</sup> Fullerton Report, ¶ 884.

<sup>631</sup> Fullerton Report, ¶ 882.

<sup>632</sup> Fullerton Report, ¶ 887.

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‘988 Patent ... [and] no awards have been granted as a result of the purported discovery of the ‘988 Patent.”<sup>633</sup>

287. To further assess Dr. Fullerton’s claim regarding the relative contributions and values of the ‘039 Patent and the ‘988 Patent to the HDD industry, I conducted a “forward citations” analysis. Forward citations occur when a patent is identified by subsequent patents as prior art.<sup>634</sup> Economics literature finds that there is a positive correlation between the number of forward citations a patent receives and the patent’s value.<sup>635</sup> With that understanding, one can analyze the relative economic value of patents by comparing forward citation counts. Courts have accepted forward citations analysis in many patent litigations.<sup>636</sup>
288. A proper forward citations analysis requires adjusting the forward citation numbers to account for differences in age and patent category between the patents-under-comparison.<sup>637</sup> For example, an older patent has more time to accumulate citations, and

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<sup>633</sup> Fullerton Report, ¶ 887.

<sup>634</sup> Falk, Nathan, and Kenneth Train, Patent Valuation with Forecasts of Forward Citations, Journal of Business Valuation and Economic Loss Analysis 12.1 (2017): 101-21, at 1-2.

<sup>635</sup> Patent value has been measured by stock market response, manager opinions, company profits on patented product, or technological advancement in measurable terms. *See, e.g.* Trajtenberg, Manuel, “A Penny for Your Quotes: Patent Citations and the Value of Innovations,” *The Rand Journal of Economics* (1990): 172-87; Dietmar Harhoff, Francis Narin, Frederic M. Scherer, and Katrin Vopel, “Citation Frequency and the Value of Patented Inventions,” *Review of Economics and Statistics* 81.3 (1999): 511-15; Dietmar Harhoff, Frederic Scherer, and Katrin Vopel, “Citation, Family size, Opposition and the Value of Patent Rights,” *Research Policy*, 1596 (2002); Bronwyn H. Hall, Adam Jaffe, and Manuel Trajtenberg, “Market Value and Patent Citations,” *RAND Journal of Economics* (2005): 16-38; “Petra Moser, Joerg Ohmstedt, and Paul W. Rhode. Patent citations and the size of patented inventions: Evidence from hybrid corn,” No. w21443. National Bureau of Economic Research (2015); Leonid Kogan, Dimitris Papanikolaou, Amit Seru, and Noah Stoffman, “Technological Innovation, Resource Allocation, and Growth,” *The Quarterly Journal of Economics* 132, no. 2 (2017): 665-712.

<sup>636</sup> *See, e.g., Comcast Cable Communs., LLC v. Sprint Communs. Co., LP*, 218 F. Supp. 3d 375, 382-384 (E.D. Penn. 2016) (“the forward citation method of analysis has been recognized in the academic literature as reliable since the 1990s... Dr. Cox’s use of forward citation analysis in his expert opinion is therefore reliable under *Daubert*”); *Intel Corp. v. Future Link Sys., LLC*, No. 14-377, 2017 U.S. Dist. LEXIS 91699, at 9-16 (D. Del. June 8, 2017); *Better Mouse Co. v. SteelSeries ApS*, No. 14-198, 2016 U.S. Dist. LEXIS 16611, at 5-9 (E.D. Tex. Jan. 5, 2016); *PersonalWeb Techs. LLC v. IBM*, No. 16-1266, 2017 U.S. Dist. LEXIS 116422, at 6-8 (N.D. Cal. July 25, 2017)

<sup>637</sup> *See, e.g.,* Bronwyn H. Hall, Adam B. Jaffe, and Manuel Trajtenberg. “The NBER Patent Citation Data File: Lessons, Insights and Methodological Tools,” No. w8498. National Bureau of Economic Research (2001).



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patents in one technological area may be cited at a different frequency than those in another area.

289. The '988 Patent was issued in 2006 in the 428 patent class (stock material or miscellaneous articles).<sup>638</sup> The '039 Patent was issued in 1990 and classified into the 324 patent class (electricity: measuring and testing).<sup>639</sup> In order to account for the differences in the ages and patent classes between these two patents, I employed a model using all U.S. patents issued in the 324 and 428 classes over the past fifty years.<sup>640</sup> This model predicts the average number of forward citations a patent in the two classes received by any given age. The citations a patent receives in excess of the predicted amount, therefore, reflect the unique value of the patent, adjusted for the effect of age and patent class. Using the above model, I calculated the '988 Patent to have 23 adjusted-forward citations, and the '039 Patent to have 144.<sup>641</sup>
290. The results of the forward citations analysis provides useful context for the valuation of the '988 Patent. The substantially fewer adjusted-forward citations for the '988 Patent, therefore, indicates that the '988 Patent, by that measure, is not as valuable as the '039 Patent, for which Seagate paid \$1.2 million.<sup>642</sup>
291. Ms. Lawton wrote that, while the Jülich licenses pertain to a major technological transition in the HDD industry (from MR to GMR), "the patent owner is a German Research Institute funded by the German government and began its licensing efforts in or about 1990—too

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<sup>638</sup> U.S. Patent 7,128,988; <https://www.uspto.gov/web/patents/classification/uspc428/defs428.htm> (accessed on June 13, 2018)

<sup>639</sup> U.S. Patent No. 4,949,039; <https://www.uspto.gov/web/patents/classification/uspc324/defs324.htm> (accessed on June 13, 2018)

<sup>640</sup> Tab 17.

<sup>641</sup> See Tab 17 for details for the regression model, data, and the sensitivity checks I conducted.

<sup>642</sup> SEA00183921-27, at 21, 23, 24, 27.

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early, and years in advance of the transition to GMR that began in 1997 (IBM).”<sup>643</sup> Ms. Lawton failed to acknowledge that Seagate’s license of the ‘039 Patent was granted in 1997, and, therefore, coincided with the industry’s transition to GMR.<sup>644</sup> As such, similar to the hypothetical license to the ‘988 Patent, the time of the Jülich Institute-Seagate license coincided with the transition to the next-generation technology.

292. Although Ms. Lawton suggested that the ‘039 Patent is not comparable to the ‘988 Patent because the claimed invention of the ‘039 Patent required additional development,<sup>645</sup> the claimed invention of the ‘988 Patent had not been developed or commercialized by LS or LMS<sup>646</sup> and, therefore, would have required (and actually did require) additional investment by the licensee.<sup>647</sup> As such, the need for additional development is not a distinguishing characteristic.

293. In her report, Ms. Lawton also wrote that “the effective royalty rate [of the Grünberg patent license] based on products *that incorporated only* the Grunberg technology ... was approximately 2.1% of HDD sales.”<sup>648</sup> However, I understand that the technology covered by the Grünberg patent was used in *all* of Seagate’s GMR HDD products,<sup>649</sup> which amounted to more than \$23 billion in HDD sales during the period August 2000 through March 2008.<sup>650</sup> Ms. Lawton inappropriately removed from her purported “effective royalty rate” calculation millions of GMR HDD sales that incorporated the Grünberg patented

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<sup>643</sup> Lawton Report, ¶ 994.

<sup>644</sup> SEA00183921-27, at 26, 27; Lawton Report, ¶¶ 288, 611, 749, 770.

<sup>645</sup> Lawton Report, ¶ 994.

<sup>646</sup> Lambeth 02/26 Deposition, February 26, 2018, at 43-44.

<sup>647</sup> See, e.g., Ross Report, ¶¶ 6, 65-93.

<sup>648</sup> Lawton Report, ¶ 753 (emphasis in italics added).

<sup>649</sup> See, e.g., *Siemens AG v. Seagate Technology, LLC*, Case No. 8:06-cv-00788-JVS-AN (C.D. Cal.), Dkt. 780 (Trial Transcript, December 4, 2008), 59:10-15; 65:12-19; and 72:1-8.

<sup>650</sup> Lawton Report, ¶ 1034; Section IV.C.1.a.

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technology, *in addition to* other technologies developed by IBM.<sup>651</sup> Her calculation is therefore flawed and unreliable.

**b. Censtor Licenses**

294. As explained above, Censtor had developed multiple technologies related to HDDs, including PMR technologies. By mid-1995, Censtor had accumulated a patent portfolio consisting of 13 issued U.S. patents, 12 pending U.S. patent applications, seven foreign patents, and a number of foreign patent applications,<sup>652</sup> which it had licensed out to six companies.<sup>653</sup> Plaintiffs' technical expert, Dr. Coffey, and Seagate's technical expert, Dr. Fullerton, agree that some of the Censtor patents included in those license agreements are technologically comparable to the '988 Patent.<sup>654</sup> Dr. Fullerton explained that "Censtor portfolio patents relate to technology that is comparable to the '988 Patent to the extent that both are (i) directed generally to HDDs and magnetic devices; (ii) relate to structures for components in HDDs; (iii) directed to magnetic thin film components affecting the reading and writing of data in HDDs; and (iv) related to increasing areal density for data storage in HDDs."<sup>655</sup>
295. Ms. Lawton wrote that, of these six license agreements, the Censtor-Hitachi license is most useful "because it is based on a more limited number of Censtor patents and expressly excludes technology and know-how."<sup>656</sup> While the Hitachi license covered many more patents and applications than the hypothetical license, I agree with Ms. Lawton that, among these six licenses, the terms of the Hitachi license are most similar to the terms of the

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<sup>651</sup> Lawton Report, ¶ 753.

<sup>652</sup> LAMBETH-000254679-746, at LAMBETH-000254683.

<sup>653</sup> LAMBETH-000276829-908, at LAMBETH-000276847.

<sup>654</sup> Coffey Report, ¶ 108; Fullerton Report, ¶ 895.

<sup>655</sup> Fullerton Report, ¶ 895.

<sup>656</sup> Lawton Report, ¶ 1004.

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hypothetical license. For that license, Hitachi paid Censtor a lump-sum fee totaling \$4.95 million.<sup>657</sup>

296. Subsequent to those six license agreements, Censtor and Seagate entered into a one-way patent license effective as of March 7, 2002, which granted Seagate a license to Censtor's then-current portfolio of patents.<sup>658</sup> The licensed patents relate generally to disk drive technology and include all patents and patent applications filed before and after the effective date that are assigned to Censtor or its successors.<sup>659</sup>
297. Under the agreement, Censtor granted Seagate a "worldwide, nonexclusive, perpetual license, without the right to sublicense under all Censtor Patents to manufacture, have manufactured, import, use, lease, sell, and otherwise transfer disk drives and other products and processes having data storage applications."<sup>660</sup> Furthermore, Censtor released Seagate from "any and all damages, liability, suits, claims, causes of action of any kind...occurring prior to the Effective Date."<sup>661</sup>
298. This agreement called for a lump-sum payment from Seagate to Censtor totaling \$2 million. Furthermore, Seagate agreed to pay an additional one-time amount of \$2 million in the name of "Further Considerations" in the event that it ships items incorporating "Vertical Recording" to customers.<sup>662</sup>
299. In July 2003, Censtor transferred all of its right, title, and interest throughout the world in and to 30 patents and patent applications to Seagate in a Patent Assignment Agreement. In

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<sup>657</sup> Lawton Report, ¶ 1004; LAMBETH-000254815-900, at LAMBETH-000254821.

<sup>658</sup> SEA00183901-12, at 901.

<sup>659</sup> SEA00183901-12, at 901.

<sup>660</sup> SEA00183901-12, at 901.

<sup>661</sup> SEA00183901-12, at 902.

<sup>662</sup> SEA00183901-12, at 902.

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exchange, Seagate agreed to pay to Censtor a one-time fee of \$800,000.<sup>663</sup>

300. In her report, Ms. Lawton wrote that, for several reasons, the March 2002 and July 2003 agreements between Censtor and Seagate “have little, if any, relevance to the valuation analysis.”<sup>664</sup> First, she wrote that “[t]he Censtor-Seagate license agreement was executed more than four years prior to the date that the ‘988 Patent issued.”<sup>665</sup> However, Ms. Lawton’s own valuation analysis included agreements dating back to 1991 (15 years prior to the date that the ‘988 Patent was issued<sup>666</sup>). She did not explain why she believes that it is appropriate to include in a valuation analysis agreements from between 10 and 15 years prior to the hypothetical negotiation, but that it is inappropriate to include agreements from three to four years before the hypothetical negotiation.
301. Ms. Lawton also wrote that Seagate’s 30(b)(6) witness, Mr. Pechman, “was able to provide few, if any, facts regarding the license.”<sup>667</sup> Ms. Lawton did not explain why additional information regarding the circumstances surrounding the negotiation was necessary to consider these agreements in her valuation analysis when that information was not required for other agreements that she considered.
302. In addition, Ms. Lawton suggested that the Censtor-Seagate agreements related specifically to vertical recording technologies, which I understand is another term for PMR.<sup>668</sup> As the license agreement and assignment covered Censtor’s entire portfolio of patents, they also covered Censtor’s PMR patents. Ms. Lawton did not explain why the fact that patents

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<sup>663</sup> SEA03336123-33, at SEA03336123-25. The patent assignment agreement amended the Censtor 2002 License by deleting the “Further Considerations” in the Censtor 2002 License of a one-time payment of \$2 million in the event of Seagate shipping commercial volume of products incorporating “Vertical Recording”. SEA03336123-33, at SEA03336126.

<sup>664</sup> Lawton Report, ¶ 723.

<sup>665</sup> Lawton Report, ¶ 722.

<sup>666</sup> LAMBETH-000260377-794; U.S. Patent No. 7,128,988.

<sup>667</sup> Lawton Report, ¶ 722.

<sup>668</sup> Lawton Report, ¶¶ 724-25.

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pertaining to vertical recording technologies were included among the broad portfolio of patents covered by the license agreement would render those agreements irrelevant to the hypothetical negotiation, especially since she found other agreements including a smaller subset of those same patents to be very relevant.

303. Finally, Ms. Lawton wrote that “[t]he Censtor-Seagate transactions reflect Censtor’s ‘exit strategy’ and the ‘salvage value of the IP portfolio of [a] start-up’ that was ‘bought on the cheap.’”<sup>669</sup> Ms. Lawton did not provide any basis in here for asserting that Seagate gained access to Censtor’s portfolio by “buying it on the cheap.” As described above, by the time of the Censtor-Seagate license agreement, Censtor had reorganized and its business strategy changed to concentrate on licensing-out its patent portfolio, rather than licensing and manufacturing.<sup>670</sup> The company still “intend[ed] to focus its future business ... on creating royalties from [its] existing licenses and to negotiate new licenses with the remaining companies in the disk drive industry based on the technology that the Company has previously developed.”<sup>671</sup> Numerous companies, including LMS, pursue business strategies focused on licensing-out patents.<sup>672</sup> While the licensee fee paid by Seagate for access to the Censtor patents was lower than that paid by other licensees, such as Hitachi, it is not clear that the license was “bought on the cheap.”

**c. Syndia License**

304. In December 2001, Seagate entered into a license agreement with Syndia Corporation (“Syndia”) pursuant to which Syndia granted to Seagate a non-exclusive and fully paid-up

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<sup>669</sup> Lawton Report, ¶ 723.

<sup>670</sup> LAMBETH-000276218-89, at 220, 58-59.

<sup>671</sup> LAMBETH-000276331-410, at 353.

<sup>672</sup> Lambeth 02/26 Deposition, at 43-44.

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license to 33 patents issued between 1983 and 2000.<sup>673</sup> In exchange for access to these 33 patents, Seagate agreed to pay Syndia \$700,000.<sup>674</sup>

305. According to Dr. Fullerton, several of Syndia's patents were "directed toward diamond coatings used in heads and media in HDDs ... [and] include processes for using chemical vapor deposition to deposit diamond coatings," which "allowed the use of thin film media."<sup>675</sup> Dr. Fullerton explained that, "because diamond coating is 'one of the major contributors to [head media] spacing,' it is critical to improving areal density."<sup>676</sup>
306. Among the patents included in the license was U.S. Patent No. 4,702,808 (the "'808 Patent"), which "is generally directed toward chemical vapor deposition by utilizing one or more lasers to vaporize metal within a process chamber and to cause such metal to be selectively deposited on a substrate, such as microelectronic circuit chips."<sup>677</sup> According to Dr. Fullerton, "the '808 Patent relates to technology that is comparable to the '988 Patent to the extent that both (i) are generally related to thin films in HDDs; (ii) relate to use of certain thin films in HDDs; and (iii) relate to increasing areal density for data storage in HDDs."<sup>678</sup>
307. Ms. Lawton wrote that one of the patents included among the 33 patents that Syndia licensed to Seagate – U.S. Patent 6,165,616 ("the '616 patent", titled "Synthetic Diamond Coatings with Intermediate Bonding Layers and Methods of Applying Such Coatings") – was in the same patent class as the '988 Patent (*i.e.*, U.S. Classification 428 for titled "Stock

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<sup>673</sup> SEA00184216-23, at 217 and 223.

<sup>674</sup> SEA00184216-23, at 218.

<sup>675</sup> Fullerton Report, ¶ 905.

<sup>676</sup> Fullerton Report, ¶ 906.

<sup>677</sup> Fullerton Report, ¶ 907.

<sup>678</sup> Fullerton Report, ¶ 908.

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Material or Miscellaneous Articles”<sup>679</sup>).<sup>680</sup> It, therefore, met one of her two criteria for “technical comparability” because it was classified in the same “genus or family of technology that is at issue in this case.”<sup>681</sup>

308. However, Ms. Lawton dismissed the Syndia-Seagate license from her valuation analysis for the ‘988 Patent because the underlying patents did not pertain to heads.<sup>682</sup> Dr. Fullerton disagrees with Ms. Lawton’s claim that the Syndia patents do not pertain to heads. As noted above, the diamond coatings protect the head from damage and contribute to head media spacing and are, therefore, “critical to enabling higher areal density.”<sup>683</sup> Moreover, Ms. Lawton actually pointed to Dr. Christopher Bajorek’s assessment of the Syndia patents in previous litigation, in which he concluded that those “breakthrough” innovations were “essential” components of HDDs that contributed to areal density.<sup>684</sup>

309. Ms. Lawton also wrote that the Syndia-Seagate license agreement “also do[es] not appear to coincide with major technology transitions.”<sup>685</sup> The HDD industry is marked by constant innovation and short product life-cycles. In fact, Ms. Lawton wrote that “all [HDD] competitors are in a race to transfer the newest technological developments into their products ... [and i]n most instances, a new generation product was launched during the on-going lifecycle of the previous one.”<sup>686</sup> The dynamic nature of the HDD industry, therefore,

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<sup>679</sup> See <https://www.uspto.gov/web/patents/classification/uspc428/sched428.pdf> (accessed July 3, 2018).

<sup>680</sup> Lawton Report, ¶ 999.

<sup>681</sup> Lawton Report, ¶ 999.

<sup>682</sup> Lawton Report, ¶ 996.

<sup>683</sup> Fullerton Report, ¶ 906.

<sup>684</sup> Lawton Report, ¶¶ 812-13. According to Dr. Bajorek, “it becomes increasingly important as you lower the head-to disk spacing, and one has the additional challenge that as one—what one really wants to reduce is the magnetic spacing between the head and the disk. These diamond films are nonmagnetic, so you have to make them thinner in addition to making them harder in order to protect the head and disk as one reduces the head-to-disk spacing.” Lawton Report, ¶ 812.

<sup>685</sup> Lawton Report, ¶ 996.

<sup>686</sup> Lawton Report, ¶ 345.



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conflicts with Ms. Lawton's suggestion that access to Syndia's patents would somehow be less valuable because the agreement did not go into effect at a specific time. It is also inappropriate for Ms. Lawton to suggest that LMS would be able to extract a license payment greater than the value of the '988 Patent due to hold-up and the construct of the hypothetical negotiation in patent litigation.<sup>687</sup>

310. Ms. Lawton wrote that the Syndia-Seagate license resulted from litigation or was under the threat of litigation.<sup>688</sup> She did not explain why or how this would bias the value of the license.

**d. White License**

311. Dr. James White was a former professor of mechanical engineering at the University of Tennessee and a previous employee at IBM, whose specialty was "fluid dynamics – particularly air flows over components within a hard disk drive."<sup>689</sup> Over time, Dr. White accumulated a series of patents that were "generally directed toward sliders used in HDDs."<sup>690</sup> Between 1989 and September 2007, Dr. White had licensed his patents to at least 22 companies, including IBM and Seagate.<sup>691</sup>
312. The November 2000 license between Dr. White and IBM granted IBM access to four of Dr. White's U.S.-issued patents for the life of those patents, and also covered "any additional patents that were filed and owned by White two years before the execution of

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<sup>687</sup> Section IV.C.1.d.

<sup>688</sup> Lawton Report, ¶ 996.

<sup>689</sup> [https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3\\_04-cv-00020/pdf/USCOURTS-tned-3\\_04-cv-00020-5.pdf](https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3_04-cv-00020/pdf/USCOURTS-tned-3_04-cv-00020-5.pdf) (accessed July 11, 2018).

<sup>690</sup> Fullerton Report, ¶ 909.

<sup>691</sup> [https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3\\_04-cv-00020/pdf/USCOURTS-tned-3\\_04-cv-00020-5.pdf](https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3_04-cv-00020/pdf/USCOURTS-tned-3_04-cv-00020-5.pdf) (accessed July 11, 2018). I understand that Seagate was also among the companies with which Dr. White entered into a confidential settlement and license agreement, but Seagate was unable to disclose that settlement agreement due to confidentiality restrictions.

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the license agreement.”<sup>692</sup> In exchange, IBM paid Dr. White a lump-sum amount of \$6.5 million.<sup>693</sup>

313. U.S. Patent No. 4,673,996 (the “’996 Patent”) – one of the patents in Dr. White’s licensed portfolio – “is directed toward an air bearing slider assembly ... [that] create a pressure distribution across the slider such that the slider fly height about the media does not vary based on which track the slider is above (inner-most or outer-most) or the velocity of the media beneath the slider.”<sup>694</sup> The technology covered by the ‘996 Patent “enabled HDDs to have sliders fly much closer to the media, which in turn allowed for read heads to function more effectively in accurately detecting the magnetic fields of the bits they fly over.”<sup>695</sup> According to Dr. Fullerton, “the ‘996 Patent relates to technology that is comparable to the ‘988 Patent to the extent that both are related to (i) subcomponents in HDDs; (ii) a component in HDDs, the transducer head; and (iii) increasing areal density for data storage in HDDs.”<sup>696</sup>
314. In her report, Ms. Lawton dismissed the license agreement between Dr. White and IBM because, in describing the advantages of Dr. White’s patents, “the Court [in the underlying litigation] did not mention increased areal density—which is the key advantage of the LMS ‘988 Patent.”<sup>697</sup> However, Dr. Fullerton explained that “the areal density of HDD media is closely related to the fly height of the slider,” to which the technology covered by the ‘996

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<sup>692</sup> [https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3\\_04-cv-00020/pdf/USCOURTS-tned-3\\_04-cv-00020-5.pdf](https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3_04-cv-00020/pdf/USCOURTS-tned-3_04-cv-00020-5.pdf) (accessed July 11, 2018).

<sup>693</sup> [https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3\\_04-cv-00020/pdf/USCOURTS-tned-3\\_04-cv-00020-5.pdf](https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3_04-cv-00020/pdf/USCOURTS-tned-3_04-cv-00020-5.pdf) (accessed July 11, 2018).

<sup>694</sup> Fullerton Report, ¶ 909.

<sup>695</sup> Fullerton Report, ¶ 909.

<sup>696</sup> Fullerton Report, ¶ 910.

<sup>697</sup> Lawton Report, ¶ 995.

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Patent is directed.<sup>698</sup>

315. Ms. Lawton also wrote that “the licensing of the White patents does not appear to coincide with major technology transitions,” and that the White-IBM license “was granted under special terms because of Dr. White’s prior relationship with IBM.”<sup>699</sup> As discussed above, due to the dynamic nature of innovation in the HDD industry, there is no basis for Ms. Lawton’s suggestion that the value of a license to the White patents would be discounted because it did not go into effect on a specific date. It is also inappropriate for Ms. Lawton to suggest that LMS would be able to extract a license payment greater than the value of the ‘988 Patent due to hold-up and the construct of the hypothetical negotiation in patent litigation.<sup>700</sup> Ms. Lawton did not explain how the prior relationship between Dr. White and IBM would bias the license fee, or why Dr. White would be willing to accept a payment lower than the value of his patent portfolio from a large manufacturer with substantial resources, such as IBM.

### 3. Summary

316. There are several useful license agreements and valuations of the ‘988 Patent (all of which included the foreign equivalents to the ‘988 Patent):

- Acacia’s allocation of value to the ‘988 Patent resulting from the Samsung license agreement of [REDACTED];<sup>701</sup>
- LS’s settlement with Acacia for [REDACTED] which implies that LMS might have agreed to a royalty payment from the Samsung license to the ‘988 Patent of up to

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<sup>698</sup> Fullerton Report, ¶ 909.

<sup>699</sup> Lawton Report, ¶ 995.

<sup>700</sup> Section IV.C.1.d.

<sup>701</sup> Mitchell Deposition, at 45.

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\$4 million;<sup>702</sup>

- Dr. Lambeth's valuation reported to the IRS that the total fair market value of LMS, the only assets of which are patents including the '988 Patent and foreign counterparts, was \$463,000;<sup>703</sup> and
- LMS's license with TDK, which, when scaled to the royalty bases offered by Ms. Lawton, suggest a royalty payment from \$5.1 million to a maximum of \$10.2 million.<sup>704</sup>

317. There are also other industry licenses that cover patented technologies that are somewhat comparable to, if not more valuable than, the technology asserted by the '988 Patent:

- Jülich's license agreement with Seagate, which granted Seagate access to the groundbreaking, and Nobel prize-winning technology at a time when the HDD industry was transitioning to this technology,<sup>705</sup> in exchange for a lump-sum payment of \$1.2 million;<sup>706</sup>
- the Censtor-Hitachi license agreement, which covered technology that the plaintiff's and defendant's experts agree is technologically comparable to the '988 Patent, and which Ms. Lawton and I agree contains terms that are relatively similar to the hypothetical negotiation (but grants access to multiple patents), for which Hitachi paid a lump-sum payment of \$4.95 million;<sup>707</sup>
- the Censtor-Seagate license agreement, which also covered technology that LMS's

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<sup>702</sup> Section V.C.1.a.

<sup>703</sup> Lambeth 02/26 Deposition, at 83-88; LAMBETH-000310374; LAMBETH-000310375-79; LAMBETH-000310380-84; and LAMBETH-000310385-96.

<sup>704</sup> Section IV.C.2.d; Tabs 9 and 12.

<sup>705</sup> Lawton Report, ¶¶ 288, 611, 749, 770.

<sup>706</sup> SEA00183921-27, at 21, 23, 24, 27.

<sup>707</sup> Lawton Report, ¶ 1003; LAMBETH-000254815 - LAMBETH-000254900, at LAMBETH-000254821.

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and Seagate's technical experts agree are comparable to the '988 Patent, for which Seagate paid Censtor a lump-sum payment of \$2 million;<sup>708</sup>

- the Syndia-Seagate license, which covers at least one patent that Dr. Fullerton opined is technologically comparable to the '988 Patent, for which Seagate paid a lump-sum payment of \$700,000;<sup>709</sup> and
- the White-IBM license, which granted IBM access to multiple patents, including at least one that Dr. Fullerton determined is technologically comparable to the '988 Patent, in exchange for a lump-sum payment of \$6.5 million.<sup>710</sup>

318. While each of these above licenses covered more than a single patent, the preponderance of the evidence supports a royalty payment associated with the hypothetical license to the '988 Patent ranging from approximately \$3 million to \$8 million (the value of the Censtor-Hitachi royalty payment in 2006 dollars).<sup>711</sup> There is some evidence to support a number as high as \$10 million, but no evidence to support a number beyond that.

**D. Cost Approach**

319. As described above, the Cost Approach attempts to measure costs that would be incurred to avoid infringement of a patent.<sup>712</sup>

320. I understand that the '988 Patent does not teach PMR technology, nor is it even essential to PMR technology; it is one way to slightly fine tune one class of materials that can be used in accomplishing PMR.<sup>713</sup> According to Dr. Fullerton, "Seagate independently

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<sup>708</sup> SEA00183901-912, at 902.

<sup>709</sup> SEA00184216-223, at 218; Fullerton Report, ¶ 908.

<sup>710</sup> [https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3\\_04-cv-00020/pdf/USCOURTS-tned-3\\_04-cv-00020-5.pdf](https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3_04-cv-00020/pdf/USCOURTS-tned-3_04-cv-00020-5.pdf) (accessed July 11, 2018); Fullerton Report, ¶ 910.

<sup>711</sup> Tabs 13 and 19.

<sup>712</sup> Reilly and Schweihs (1999), at 97.

<sup>713</sup> Conversation with Dr. Eric Fullerton, July 11, 2018 ("Conversation with Fullerton").

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developed PMR technology beginning in the 1990s, resulting in prototypes no later than 2001—including those using FeCo in the write heads—well before the publication or issuance of the ‘988 Patent.”<sup>714</sup> He wrote that “the purported invention of the ‘988 Patent at most had an incremental effect in improving uniaxial anisotropy in write heads,” and “any such improvement would be *de minimis* at best, and uniaxial anisotropy could be derived from multiple other prior art sources, including from shape, pair ordering, and strain.”<sup>715</sup>

321. The ‘988 Patent does not solve issues associated with “erase after write” (or “EAW”), whereby data are unintentionally erased after being recorded on a disk.<sup>716</sup> In fact, many other technologies can be and have been used to address EAW.<sup>717</sup>

**E. Income Approach**

322. There currently is no information on profits attributable to the ‘988 Patent technology. As a result, the Income Approach is not particularly informative in this case. Although Ms. Lawton claimed that Seagate saved costs associated with the number of heads that go into PMR versus LMR HDDs,<sup>718</sup> there is no evidence of substantially increased profits in or around the time of the first alleged infringement. In fact, available evidence indicates that Seagate’s profitability was no different before versus after switch to PMR technology.<sup>719</sup> Seagate’s operating margin actually deteriorated from 8.4 percent before fiscal year 2006 to 8.2 percent after.<sup>720</sup>

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<sup>714</sup> Fullerton Report, ¶ 873.

<sup>715</sup> Fullerton Report, ¶ 887.

<sup>716</sup> Conversation with Fullerton.

<sup>717</sup> Conversation with Fullerton.

<sup>718</sup> Lawton Report, ¶ 933.

<sup>719</sup> Tab 3.

<sup>720</sup> Tab 3.

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323. Further, though Ms. Lawton claimed that the switch to PMR reduced Seagate's costs,<sup>721</sup> she neither claimed nor showed how any cost reductions are attributable to the '988 Patent alone.

**F. *Georgia-Pacific* Analysis**

324. As explained above, the preponderance of the quantitative evidence suggests a range of \$3 million to \$8 million, and no greater than \$10 million.<sup>722</sup>

325. The low end of this range is greater than the amount that Seagate had paid for access to the Grünberg patent, the "ground-breaking" discovery of GMR for which the inventors received a Nobel Prize.<sup>723</sup> Rather, the low-end of the range here represents the allocation of value to the '988 Patent (and its foreign equivalents) from the Samsung license agreement. As noted above, this allocation implies that, of the more than 1,000 patents covered by the Samsung license, the '988 Patent was among the 15 most valuable patents.<sup>724</sup> The settlement between LS and Acacia suggests that LS might have been willing to license the '988 Patent and its foreign equivalents to Samsung in exchange for an amount up to \$4 million.<sup>725</sup>

326. The high end of the range of \$8 million represents the lump-sum royalty amount from the Censtor-Hitachi license agreement, which I have adjusted for inflation to 2006 dollars. Although this license agreement covers multiple patents, Dr. Coffey and Dr. Fullerton agreed that at least one patent is technologically similar to the '988 Patent.<sup>726</sup> Ms. Lawton

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<sup>721</sup> See, e.g., Lawton Report, ¶¶ 392-94, 1008.

<sup>722</sup> Tab 12.

<sup>723</sup> SEA00183921-927, at 924; [https://www.nobelprize.org/nobel\\_prizes/physics/laureates/2007/press.html](https://www.nobelprize.org/nobel_prizes/physics/laureates/2007/press.html) (accessed June 11, 2018).

<sup>724</sup> Section IV.C.1.a.

<sup>725</sup> Section IV.C.1.a.

<sup>726</sup> Coffey Report, ¶ 108; Fullerton Report, ¶ 895.

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also wrote that this agreement contained terms similar to the hypothetical negotiation.<sup>727</sup>

327. The maximum amount of \$10 million reflects the settlement amount paid by TDK for a license to the '988 Patent and its foreign equivalents, scaled to reflect the largest royalty base offered by Ms. Lawton. While Ms. Lawton's estimated royalty bases are unreliable and inflated, by applying Ms. Lawton's own scaling methodology and quantities,<sup>728</sup> they provide a basis to estimate the absolute maximum amount for consideration.
328. Additional (mostly) qualitative factors should be (and are) considered to account for differences between the Market, Cost, and Income Approaches and the hypothetical negotiation, and should be (and are) considered in choosing a royalty within the range under consideration. These factors largely emanate from the *Georgia-Pacific* case.<sup>729</sup>

**1. Georgia-Pacific Factor 1**

*The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty.*

329. As described above, while it owned the '988 Patent, Acacia entered into a license agreement with Samsung that granted rights to the '988 Patent and its foreign equivalents.<sup>730</sup> The terms of the settlement between LS and Acacia provided information regarding the amount for which LS would have been willing to license the '988 Patent and its foreign equivalents.<sup>731</sup> Subsequent to the reassignment of the '988 Patent to LMS, it entered into a settlement agreement with TDK.<sup>732</sup>
330. These licenses, among others, were considered in the Market Approach, and thus, provide

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<sup>727</sup> Lawton Report, ¶ 1004.

<sup>728</sup> Tab 9.

<sup>729</sup> *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971).

<sup>730</sup> ARC0003093-189, at 117.

<sup>731</sup> LAMBETH-000224014-31, at 14.

<sup>732</sup> Lawton Report, ¶ 960.



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no additional guidance here.

**2. Georgia-Pacific Factor 2**

*The rates paid by the licensee for the use of other patents comparable to the patent in suit.*

331. As described above, Dr. Fullerton has determined that the technologies covered by Seagate's licenses with (1) the Jülich Institute (the Grünberg Patent), (2) Censtor, and (3) Syndia (the '808 Patent), are technologically comparable to, or are of greater value than, the '988 Patent. These licenses were considered in the Market Approach, and thus, provide no additional guidance here.
332. Dr. Fullerton also concluded that at least three patents to which Seagate gained access through its affiliation with CMU's DSSC are technologically comparable to, if not more valuable than, the '988 Patent.<sup>733</sup> As part of its agreement, Seagate pays an annual amount of \$250,000 to DSSC.<sup>734</sup> However, while the amount that Seagate pays for access to numerous groundbreaking HDD- and head-related technologies provides useful context, the annual payment reflects an investment in R&D and cannot directly be attributed to a royalty payment for a license to a given patent.
333. Dr. Fullerton also wrote that Seagate's license agreement with Dr. White granted Seagate access to a patent (the '996 Patent) that is technologically comparable to the '988 Patent.<sup>735</sup> However, as that agreement could not be produced in this matter due to confidentiality restrictions, it cannot offer additional guidance here. The White-IBM license agreement, which also granted access to the '996 Patent, was considered in the Market Approach.

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<sup>733</sup> Fullerton Report, ¶¶ 897-904.

<sup>734</sup> SEA02238164-70, at 67, 189.

<sup>735</sup> Fullerton Report, ¶ 910.

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**3. Georgia-Pacific Factor 3**

*The nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold.*

**a. IP Covered by License**

334. The hypothetical negotiation construct used to assess reasonable royalty damages presumes a “naked license” that only provides the licensee (*i.e.*, the alleged infringer) with permission to practice the patent(s)-at-issue. It does not provide for the transfer of any know-how, technical assistance, or any other intellectual property rights from the patent holder/licensor to the alleged infringer/licensee.
335. I already have assessed the licenses considered in the Market Approach to account for the bare patent license here. As explained above, the licenses considered in the Market Approach provide access to multiple patents, whereas the hypothetical license would cover only the ‘988 Patent. This suggests a lower royalty is appropriate in the hypothetical license compared to those that were part of the licenses discussed above, all else equal.

**b. Exclusivity**

336. The hypothetical license construct used to assess reasonable royalty damages presumes a non-exclusive license, as it is intended only to provide the hypothetical licensee with the right to *use* the technology-at-issue and does not, for example, provide the hypothetical licensee the right or ability to prevent other parties from practicing the technology.<sup>736</sup>

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<sup>736</sup> In *Mobil Oil Corp. v. Amoco Chemicals Corp.*, 915 F. Supp. 1333 (D. Del. 1994), the court noted that a “patent owner may recover as a measure of damages the royalty rate established by prior actual licenses for acts comparable to those engaged in by the infringer without authority.” *Mobil Oil Corp. v. Amoco Chemicals Corp.*, 915 F. Supp. 1333, 1343 (D. Del. 1994). In its decision, the court drew a parallel between the hypothetical license and a non-exclusive license, noting that “[t]he rights needed by Amoco to use [the infringing] process are similar to the rights granted to the ... licensees” which was a “non-exclusive license.” *Mobil Oil Corp. v. Amoco Chemicals Corp.*, 915 F. Supp. 1333, 1344 (D. Del. 1994). The court also wrote that “[t]he rights infringed by Amoco were similar or ‘comparable’ to the rights granted under the standard license.” *Mobil Oil Corp. v. Amoco Chemicals Corp.*, 915 F. Supp. 1333, 1344 (D. Del. 1994).

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Moreover, the patent owner cannot and should not be effectively constrained by the hypothetical license from suing or licensing any other party it deems appropriate under its patents.

337. The licenses considered in the Market Approach are non-exclusive, as the hypothetical license would be here. Thus, this consideration provides no additional guidance.

**c. Legal Strength of IP**

338. The hypothetical license construct used to assess reasonable royalty damages presumes that the patent(s)-at-issue have been shown to be valid, enforceable, and infringed, and that both parties are aware of these facts. In contrast, the *actual* licenses produced by the parties in this proceeding and the relevant industry licenses discussed in the previous section were not, as a general matter, negotiated under conditions where the patent(s)-at-issue had been conclusively found to be valid, enforceable, or infringed.
339. This suggests a higher royalty is appropriate in the hypothetical license compared to those that were part of the licenses discussed above, all else equal.

**d. Territory and Customer Restrictions**

340. The hypothetical license construct used to assess reasonable royalty damages is assumed to be free of territorial and customer restrictions – as no such bounds were placed on the alleged infringer during the period of the alleged infringement.
341. The licenses considered in the Market Approach have no territory or customer restrictions, just like the hypothetical license here. Thus, this consideration provides no additional guidance.

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**4. Georgia-Pacific Factor 4**

*The licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.*

342. The hypothetical negotiation is assumed to be conducted in an environment in which the patent holder is willing to grant the alleged infringer permission to practice the patent(s)-at-issue in exchange for compensation adequate for the alleged infringer's unauthorized use of the patent(s)-at-issue.
343. In the present case, as Dr. Lambeth noted, he had "decided to try and license the Lambeth Patents,"<sup>737</sup> and assigned the '988 Patent and its foreign equivalents to Acacia because he believed that "Acacia would have some success in licensing the patent."<sup>738</sup> Dr. Lambeth also explained that neither LS nor LMS had ever "manufactured or sold any product that uses the invention claimed in the '988 patent."<sup>739</sup> As such, LMS's business model was to license the '988 Patent and its foreign equivalents. This business model is reflected in the previous license agreements covering the '988 Patent, as well as the Jülich-Seagate license agreement, the Censtor license agreements, and the White-IBM license agreement.
344. Because this is taken into account in the licenses considered under the Market Approach, this has no additional effect on the outcome of the hypothetical negotiation.

**5. Georgia-Pacific Factor 5**

*The commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promoter.*

345. Ms. Lawton and I are in agreement that LMS and Seagate are not competitors.<sup>740</sup> As noted

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<sup>737</sup> Mitchell Deposition, Exhibit 20, at 4.

<sup>738</sup> Lambeth 02/26 Deposition, at 301-02.

<sup>739</sup> Lambeth 02/26 Deposition, at 43-44.

<sup>740</sup> Lawton Report, ¶ 71.

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above, LMS has never commercialized or sold any products that embody the '988 Patent.<sup>741</sup> Thus, at the time of each agreement, LMS was not in a competitive relationship with the entities that have taken licenses to the '988 patent.

346. This factor provides no additional guidance here relative to the Market Approach.

**6. Georgia-Pacific Factor 6**

*The effect of selling the patented specialty in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales.*

347. In some instances, sales of products embodying the patented technology enhance the sales of related goods and services. The existence of such sales, referred to as tag-along or convoyed sales, increases the value of the protection provided by the hypothetical license.

348. Ms. Lawton wrote that she is "not aware of any facts that suggest that Seagate's sales of the Accused Products generated sales of non-patented items."<sup>742</sup> I agree with Ms. Lawton.

349. This factor has a downward effect on the outcome of the hypothetical negotiation.

**7. Georgia-Pacific Factor 7**

*The duration of the patent and the term of the license.*

350. The '988 patent expires on August 22, 2022, according to Ms. Lawton,<sup>743</sup> approximately 16 years after the date of the hypothetical negotiation, and 10 years after the beginning of the alleged damages period.

351. I have seen no evidence in this case linking the duration of the patent or term of the license to payment under a license. That is, the licenses examined in the Market Approach do not appear to adjust payment for the length of the license period or the length of the patent life.

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<sup>741</sup> Lambeth 02/26 Deposition, at 43-44.

<sup>742</sup> Lawton Report, ¶ 1152.

<sup>743</sup> Lawton Report, ¶ 968.

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352. This factor provides no additional guidance.

**8. Georgia-Pacific Factor 8**

*The established profitability of the product made under the patent; its commercial success; and its current popularity.*

353. Generally, greater commercial success of an accused product will tend to increase an alleged infringer's ability and willingness to pay for access to a patent-at-issue. In the present case, the determination of the commercial success and popularity of the Accused Products can be assessed based on the actual market acceptance (*i.e.*, sales and profitability) of these products.

354. Seagate's HDD products have been very successful, although the success has not been attributed solely to the coverage of the '988 Patent as opposed to the multitude of other technologies embodied in Seagate's HDDs. As explained above, the '988 Patent is directed to a technology that is allegedly practiced in the write pole, a subcomponent of the write head, which is a subcomponent of a wafer level slider, which is a subcomponent of an HGA, which is but one of many subassemblies in an HDD. Furthermore, while Seagate's products have been successful, HDD shipments globally have been on an almost constant decline and the HDD business has been characterized by decreasing average selling prices, as explained above.<sup>744</sup>

355. Nonetheless, I have considered this factor to be upward-pointing.

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<sup>744</sup> See discussions above in paragraphs 45-50.

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**9. Georgia-Pacific Factor 9**

*The utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results;*

*and*

**10. Georgia-Pacific Factor 10**

*The nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.*

356. It is my understanding that the '988 Patent does not teach or otherwise enable PMR technology. According to Dr. Fullerton, even assuming "that the invention claimed in the '988 Patent would 'contribute' to uniaxial anisotropy ... any such contribution would be negligible at best—on the order of a few oersteds—and certainly in no way 'critical' to having a viable write head for PMR media."<sup>745</sup>

357. The presumed incremental benefits associated with the patented technology have been taken into consideration in my analysis of the Market Approach. No further adjustment is required here.

**11. Georgia-Pacific Factor 11**

*The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use.*

358. Allegedly infringing products represent a large portion of Seagate's revenues. According to Ms. Lawton, virtually all HDDs sold by Seagate infringe on the '988 Patent.<sup>746</sup>

359. This factor is upward-pointing.

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<sup>745</sup> Fullerton Report, ¶ 874.

<sup>746</sup> Tab 5.A.

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**12. Georgia-Pacific Factor 12**

*The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the patent or analogous patents.*

360. I have seen no evidence of customary profit or selling price splits besides those reflected in the Market Approach.

361. This factor has a neutral effect on the outcome of the hypothetical negotiation.

**13. Georgia-Pacific Factor 13**

*The portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer.*

362. The Seagate component that allegedly uses the patented technology is the write pole, which is incorporated in the write head and the write head is incorporated into the slider (which contains both the read and write heads). The Accused Products reflect Seagate's use of numerous technologies above and beyond the feature allegedly enabled by the '988 Patent. The determination of the value of the patented technology to Seagate must properly apportion Seagate's profits from the sale of Accused Products between the portion that is attributable to the alleged use of the patented technology and the portion that is attributable to other technology contributors. Ms. Lawton did not perform any such analysis.

363. According to Dr. Fullerton, "the purported invention of the '988 Patent at most had an incremental effect in improving uniaxial anisotropy in write heads" – an effect which he later characterized as "*de minimis* at best."<sup>747</sup> In contrast, "the contributions to uniaxial anisotropy from other sources in the write head—such as from shape and stress—would

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<sup>747</sup> Fullerton Report, ¶ 887.



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dwarf those of any alleged contributions from having a symmetry broken magnetic layer in the write head.”<sup>748</sup>

364. As this evidence was already taken into consideration in the Market Approach, it provides no additional guidance here.

**14. Georgia-Pacific Factor 14**

*The opinion of qualified experts.*

365. I have considered the opinions of Dr. Caroline A. Ross and Dr. Eric Fullerton, Seagate's technical experts, and they are included in the discussion of the products and technology.

**15. Georgia-Pacific Factor 15**

*The amount that a willing licensor would have agreed to accept, and that a willing licensee would have agreed to pay at the time the infringement began.*

366. Based upon my review and analysis of the evidence received to date, I have drawn two principal conclusions with respect to the appropriate royalty in this case for a license to the '988 Patent.

367. First, I have concluded that the hypothetical negotiation would have resulted in a lump-sum royalty payment. This conclusion is based on several considerations:

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

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<sup>748</sup> Fullerton Report, ¶ 874.

<sup>749</sup> Tab 7.

<sup>750</sup> Pechman Deposition, at 94.

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- the fact that the two negotiated licenses covering the '988 Patent – the license negotiated between Acacia and Samsung, and the license negotiated between LMS and TDK – both consisted of upfront lump-sum royalty payments.<sup>752</sup>

368. Second, I have concluded that the reasonable royalty damages that are appropriate in this case should be based on a lump-sum payment in the range of \$3 million to \$8 million for a license to the '988 Patent. This conclusion is based on information regarding valuations of and royalty payments for licenses covering the '988 Patent, as well as licenses covering technologically similar patents. Evidence from valuations of and licenses covering the '988 Patent include the following,

- Acacia's allocation of value to the '988 Patent (and its foreign equivalents) resulting from the Samsung license agreement of ██████████,<sup>753</sup>
- LS's settlement with Acacia for ██████████, which implies that LMS might have agreed to a royalty payment from the Samsung license to the '988 Patent (and its foreign equivalents) of up to \$4 million;<sup>754</sup>
- Dr. Lambeth's valuation reported to the IRS that the total fair market value of LMS, the only assets of which are the '988 Patent and foreign counterparts, was \$463,000;<sup>755</sup> and
- LMS's license with TDK, which, when scaled to the (unreliable) royalty bases put

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<sup>751</sup> Shay Deposition, at 154.

<sup>752</sup> ARC003093-189 at ARC0003095, ¶ 2.1; LAMBETH-000222078-98 at LAMBETH-000222083 and 85.

<sup>753</sup> Mitchell Deposition, at 45.

<sup>754</sup> Section IV.C.1.a.

<sup>755</sup> Lambeth 02/26 Deposition, at 83-88; LAMBETH-000310374; LAMBETH-000310375-79; LAMBETH-000310380-84; and LAMBETH-000310385-96.

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forward by Ms. Lawton, suggest a royalty payment from \$5.1 million to a maximum of \$10.2 million.<sup>756</sup>

369. There are also other industry licenses that cover patented technologies that are somewhat comparable to, if not more valuable than, the technology asserted by the '988 Patent:

- Jülich's license agreement with Seagate, which granted Seagate access to the groundbreaking, and Nobel prize-winning technology, in exchange for a lump-sum payment of \$1.2 million;<sup>757</sup>
- the Censtor-Hitachi license agreement, which covered technology that the plaintiff's and defendant's experts agree is technologically comparable to the '988 Patent, and which Ms. Lawton and I agree contains terms that are relatively similar to the hypothetical negotiation (but grants access to multiple patents), for which Hitachi paid a lump-sum payment of \$4.95 million;<sup>758</sup>
- the Censtor-Seagate license agreement, which also covered technology that LMS's and Seagate's technical experts agree are comparable to the '988 Patent, for which Seagate paid Censtor a lump-sum payment of \$2 million;<sup>759</sup>
- the Syndia-Seagate license, which covers at least one patent that Dr. Fullerton wrote is technologically comparable to the '988 Patent, for which Seagate paid a lump-sum payment of \$700,000;<sup>760</sup> and
- the White-IBM license, which granted IBM access to multiple patents, including at least one that Dr. Fullerton determined is technologically comparable to the '988

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<sup>756</sup> Section IV.C.2.d; Tabs 9 and 12.

<sup>757</sup> SEA00183921-27, at 21, 23, 24, 27

<sup>758</sup> Lawton Report, ¶ 1004; LAMBETH-000254815 - LAMBETH-000254900, at LAMBETH-000254821.

<sup>759</sup> SEA00183901-912, at 902.

<sup>760</sup> SEA00184216-223, at 218; Fullerton Report, ¶ 908.

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Patent, in exchange for a lump-sum payment of \$6.5 million.<sup>761</sup>

370. To determine the low end of the range of reasonable royalties, I used the allocated value of [REDACTED] to the '988 Patent (and its foreign equivalents) resulting from the Samsung license agreement. As described above, LMS's subsequent settlement agreement with Acacia suggests that LMS might have been willing to license those patents for an amount up to \$4 million. However, as the hypothetical license would cover only one of those patents (the '988 Patent), the value of the hypothetical license may be lower than the amount suggested by the LMS-Acacia settlement agreement.

371. To determine the high end of the range of reasonable royalties, I used the lump-sum royalty payment from the Censtor-Hitachi license agreement, and adjusted the value to account for inflation to 2006 dollars (totaling \$7.8 million).<sup>762</sup> LMS's and Seagate's technical experts agree that at least one of the Censtor patents included in the portfolio that was licensed to Hitachi is technologically similar to the '988 Patent.<sup>763</sup> Ms. Lawton also wrote that the Censtor-Hitachi agreement contained terms similar to those of the hypothetical negotiation.<sup>764</sup> While the Censtor-Hitachi agreement covered multiple patents,<sup>765</sup> and may therefore be more valuable than a license to a single patent, this royalty payment provides a conservative and reliable metric for the upper-bound value of the hypothetical license to the '988 Patent.

372. While there is some evidence to support a reasonable royalty as high as \$10 million – which

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<sup>761</sup> [https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3\\_04-cv-00020/pdf/USCOURTS-tned-3\\_04-cv-00020-5.pdf](https://www.gpo.gov/fdsys/pkg/USCOURTS-tned-3_04-cv-00020/pdf/USCOURTS-tned-3_04-cv-00020-5.pdf); Fullerton Report, ¶ 910.

<sup>762</sup> Tabs 13 and 19.

<sup>763</sup> Coffey Report, ¶ 108; Fullerton Report, ¶ 895.

<sup>764</sup> Lawton Report, ¶ 1004.

<sup>765</sup> LAMBETH-000254597 - LAMBETH-000254678, at LAMBETH-000254601.

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reflects the value of the LMS-TDK settlement, scaled to the highest royalty base proffered by Ms. Lawton<sup>766</sup> – there is no evidence to support a value beyond that.

**G. Reasonable Royalty Damages**

373. Based on my review of the foregoing information, the appropriate royalty in this case for a license to the '988 Patent is a lump-sum royalty payment ranging from \$3 million to \$8 million.

**VI. PREJUDGMENT INTEREST**

374. Courts allow injured parties to receive prejudgment interest on damage awards in order to compensate successful plaintiffs for the passage of time. The appropriate interest rate is one that fairly compensates the plaintiff for the time value of money while properly accounting for risk in a financial sense. Should the Court determine that prejudgment interest is due after a judgment is entered in this case, the appropriate interest rate to use is the short-term Treasury bill rate.

375. This relatively low, mostly riskless rate is the appropriate rate because it conforms to the fundamental tenet of finance that investors who bear less risk should earn lower profits, or returns. Conversely, higher returns accrue to investors that bear higher risk. Since LMS bears virtually no risk that Seagate cannot pay the judgment at issue here, the correct interest rate is a low, relatively risk-free rate.

376. The risk/return tradeoff described above makes common sense. People or companies will only invest their hard-earned capital if the expected return is high enough to compensate for the expected risk of the investment. For example, investors in high-tech stocks expect a much higher return on average than investors in U.S. Treasury bills. However, this does

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<sup>766</sup> Tabs 9 and 12.

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not mean that the higher return from the high-tech stock is automatic, or risk-free. In fact, just the opposite is true. Individual high-tech investments can be lost entirely or can result in huge profits. The higher expected return on high-tech stocks is only available to investors on average and across a large number of years. In other words, if investors could earn this higher expected return, or cost of capital, over relatively short periods of time and with no additional risk, there would be a “free-lunch” situation. In essence, investors would be able to earn a high rate of return for free.

377. In Tab 19, I have summarized the prejudgment interest factors that should be applied to damages depending on when the damages were incurred. I will update these calculations and calculate prejudgment interest in preparation for trial. These calculations assume a damages award in or around July 2018.

## **VII. CONCLUSION**

378. Ms. Lawton has concluded that, assuming liability is proven, the appropriate remedy here is a running royalty payment of \$0.30 per HGA, which results in reasonable royalty damages in the range of \$315.1 million to \$1.382 billion.<sup>767</sup> Ms. Lawton’s analysis and conclusions are flawed for several reasons. Among other things, she inappropriately dismissed available and relevant evidence from previous licenses and valuations of the ‘988 Patent, and mischaracterized or misinterpreted many critical terms of the agreements on which she did rely. In fact, had she accurately evaluated the Censtor Corp.-Hitachi license that she described as the “starting point valuation metric”<sup>768</sup> and is at the core of

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<sup>767</sup> Lawton Report, Seagate Schedule A.1. Ms. Lawton provided a number of scenarios, labeled Scenario 1 – 3 for her damages range. She also included a separate category labeled “Worldwide HGAs,” and this category results in the highest end of the damages range, *e.g.*, \$1.382 billion. It is not clear, however, whether Ms. Lawton is offering an opinion that Lambeth is entitled to damages based on “Worldwide HGAs.”

<sup>768</sup> Lawton Report, ¶ 1004; LAMBETH-000254815-900, at LAMBETH-000254821.

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her analysis, she would have arrived at a lump-sum payment here of \$4,950,000.<sup>769</sup>

379. As a result of her flawed analysis, her estimated royalty of \$0.30 for the '988 Patent – which is directed to a technology allegedly practiced in the write pole, a subcomponent of the write head, which is a subcomponent of an HGA, which is but one of many subassemblies of a hard disk drive – would constitute roughly 90 percent<sup>770</sup> of the total cost of the smallest salable patent practicing unit (the wafer level slider, which contains, among other things, the read and write heads, a heater, and an air bearing surface<sup>771</sup>). And her resulting damages estimate is many multiples of actual amounts that have been paid for the same or similar technology in the real-world marketplace. Ms. Lawton has overstated the economic contribution and value of the '988 Patent.

380. Based upon my review and analysis of the evidence that I have received to date, reasonable royalty damages that should be paid to LMS by Seagate for the alleged infringement of the '988 Patent range from \$3 million to \$8 million, and are certainly no greater than \$10 million.<sup>772</sup> And the \$3 million may, in fact, be too high in light of the terms and significance of the Jülich license.

381. This report is based on the information that was available to me as of the date of this report. I understand that discovery in this case is ongoing. Accordingly, I may revise, supplement, or expand my opinions before trial, if necessary and allowed, based on further review and analysis of information provided to me subsequent to the submission of this report.

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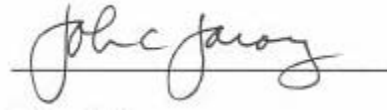
<sup>769</sup> Tab 15.

<sup>770</sup> Fullerton Report, ¶ 151.

<sup>771</sup> Fullerton Report, ¶ 151.

<sup>772</sup> Tab 13.

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A handwritten signature in dark ink, appearing to read "John C. Jarosz", is written over a horizontal line.

John C. Jarosz

July 16, 2018



**TAB 1**

**JOHN C. JAROSZ**  
**Managing Principal**

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Analysis Group, Inc.  
800 17th Street, NW  
Suite 400  
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John Jarosz, a Managing Principal of Analysis Group, Inc., specializes in applied microeconomics and industrial organization. He has performed research, given economic testimony and provided strategy consultation in intellectual property, licensing, and commercial damages matters, including

- evaluation of damages in patent, copyright, trade secret, trademark and unfair competition cases (including lost profits, reasonable royalties, price erosion, unjust enrichment, accelerated market entry, and prejudgment interest);
- evaluation of injunctive relief and commercial success in a variety of intellectual property cases;
- strategy consultation regarding the nature and value of technology, methods to share technology and reasonable compensation terms;
- analysis of compliance with FRAND/RAND commitments; and
- general commercial damages testimony in a variety of cases and across numerous industries.

Mr. Jarosz received a J.D. from the University of Wisconsin. Mr. Jarosz holds an M.A. in Economics from Washington University in St. Louis, where he was a Ph.D. candidate and completed most of the program requirements. He also holds a B.A. in Economics and Organizational Communication from Creighton University in Omaha, Nebraska.

Prior to joining Analysis Group, Mr. Jarosz was a Director with Putnam, Hayes & Bartlett, Inc. Before that, he was a Senior Analyst with Richard J. Barber Associates, a Section Supervisor with Mutual of Omaha Insurance and a Research Analyst with the Center for the Study of American Business.

**EDUCATION**

J.D.	University of Wisconsin
M.A. & Ph.D. candidate	Economics, Washington University, St. Louis
B.A., <i>Summa Cum Laude</i>	Economics and Organizational Communication, Creighton University

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**PROFESSIONAL ASSOCIATIONS/MEMBERSHIPS**

- American Economic Association
- American Law and Economics Association
- American Bar Association (Sections: Intellectual Property, Antitrust and Litigation)
- State Bar of Wisconsin (Section: Intellectual Property)
- American Intellectual Property Law Association (Sections: Federal Litigation, Licensing, Trade Secrets and Antitrust)
- Licensing Executives Society
  - Former Chair, Valuation and Taxation Committee
  - Former Member, Certified Licensing Professional Exam Writing Team
- Former Advisory Board - *The IP Litigator*
- Former Columnist (Damage Awards) - *The IP Litigator*
- Omicron Delta Epsilon (International Honor Society in Economics)
- Association of University Technology Managers
- Certified Licensing Professional
- Intellectual Property Owners Association (Committee: Damages and Injunctions)
- 2011 Presidential Rank Review Board
- Referee, Journal of Forensic Economics
- The Sedona Conference (Sections: Best Practices in Patent Litigation, Patent Damages and Remedies)
- IAM Patent 1000 (2014, 2015, 2016): The World's Leading Patent Practitioners - Economic Experts
- IP Law360: Voices of the Bar

**TESTIMONIAL EXPERIENCE**

**Patent Cases – Damages**

- **Syngenta Crop Protection, LLC v. Willowood, LLC, Willowood USA, LLC, Willowood Azoxystrobin, LLC, and Willowood Limited**  
*US District Court, Middle District of North Carolina (Case No. 1:15-cv-274)*  
Trial and deposition testimony and expert report: damages and prejudgment interest related to alleged patent and copyright infringement involving crop fungicide.

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- **Integra Lifesciences Corporation, Integra Lifesciences Sales, LLC, Confluent Surgical, Inc., and Incept, LLC v. Hyperbranch Medical Technology, Inc.**  
*United States District Court, District of Delaware (Case No. 15-cv-00819)*  
Trial and deposition testimony and expert reports: lost profits, price erosion, reasonable royalty, prejudgment interest, preliminary relief, and commercial success involving patents directed to cranial and spinal dural repair sealants.
- **Blue Spike, LLC v. Toshiba America, Inc., and Toshiba Corporation**  
*US District Court, Eastern District of Texas (Tyler Division) (Case No. 6:16-CV-430-RWS-JDL)*  
Damages hearing and early expert report: damages related to alleged patent infringement involving address space layout randomization ("ASLR") technology.
- **Audio MPEG, Inc., U.S. Philips Corporation, TDF SAS, and Institut Für Rundfunktechnik GmbH v. Dell, Inc.**  
*United States District Court, Eastern District of Virginia, Norfolk Division (Case No. 1:15-CV-1674 AJT/TCB)*  
Deposition testimony and expert report: analysis of patent pool compliance with FRAND commitments and determination of FRAND-compliant royalties involving patents directed to the transmission and storage of digital audio files.
- **Koninklijke Philips Electronics N.V. and Philips Electronics North America Corporation v. ZOLL Medical Corporation**  
*United States District Court, District of Massachusetts (Case No. 1:10-cv-11041)*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty damages, and prejudgment interest related to alleged patent infringement involving external defibrillators.
- **Erfindergemeinschaft UroPep GbR v. Eli Lilly and Company and Brookshire Brothers, Inc.**  
*US District Court, Eastern District of Texas, Marshall Division (Case No. 2:15-cv-1202-WCB)*  
Trial and deposition testimony and expert report: reasonable royalty damages related to alleged patent infringement directed to phosphodiesterase (PDE) V inhibitor(s) indicated for the treatment of benign prostatic hyperplasia.
- **Koninklijke Philips Electronics N.V. and Philips Electronics North America Corporation v. ZOLL Lifecor Corporation**  
*United States District Court, Western District of Pennsylvania (Case No. 2:2012-cv-01369)*  
Deposition testimony and expert report: damages related to alleged patent infringement involving wearable defibrillators.
- **Luminara Worldwide, LLC v. Shenzhen Liown Electronics Co., Ltd, Central Garden and Pet Co., et al.; Shenzhen Liown Electronics Co., Ltd, Central Garden and Pet Co. v. Luminara Worldwide, LLC, et al. ; and Luminara Worldwide, LLC v. Shenzhen Liown Electronics Co., Ltd and Central Garden and Pet Co., et al.**  
*United States District Court, District of Minnesota (Case Nos. 14-cv-03103 (SRN/FLN) and 15-cv-03028 (SRN/FLN))*  
Deposition testimony and expert reports: damages associated with alleged patent infringement and breach of contract, and unjust enrichment associated with breach of non-disclosure agreement and use of trade secrets, related to flameless candle technology and distribution.

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**TAB 1**

- **MobileMedia Ideas LLC v. Apple, Inc.**  
*United States District Court, District of Delaware (Case No. 10-258-SLR)*  
Trial and deposition testimony and expert report: reasonable royalty involving patents directed to incoming call, playlist, and location detection features used in smartphones, tablets, and portable media players.
- **MAZ Encryption Technologies LLC v. Blackberry Corporation**  
*United States District Court, District of Delaware (Case No. 1:13-cv-00304-LPS)*  
Deposition testimony and expert report: reasonable royalty involving a patent directed to encryption/decryption methods used in smartphone and tablet operating systems.
- **BroadSoft, Inc. v. Callwave Communications, LLC**  
*United States District Court, District of Delaware (Case No. 13-cv-0711-RGA)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to telecommunications call processing.
- **Advanced Video Technologies, LLC v. Blackberry, LTD. and Blackberry Corporation**  
*United States District Court, Southern District of New York (Case No. 1:11-cv-06604-CM-RLE)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to video compression and decompression.
- **Drone Technologies, Inc. v. Parrot S.A. and Parrot, Inc.**  
*United States District Court, Western District of Pennsylvania (Case No. 2:14-cv-0111)*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to drone technology.
- **Bayer CropScience AG and Bayer CropScience NV v. Dow AgroSciences LLC, Mycogen Plant Science Inc., Agrigenetics, Inc. d/b/a Mycogen Seeds LLC, and Phytogen Seed Company, LLC**  
*International Chamber of Commerce (Case No. 18892/VRO /AGF)*  
Arbitration hearing testimony and expert report: damages associated with alleged breach of contract and patent infringement involving genetically modified seed.
- **CertusView Technologies, LLC v. S &N Locating Services LLC and S & N Communications, Inc.**  
*United States District Court, Eastern District of Virginia, Norfolk Division (Case No. 2:13 –cv-346 (MSD/LRL))*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to creation of electronic sketches for utility location purposes.
- **Ecolab USA Inc. and Kleantech Systems, LLC v. Diversey, Inc.**  
*United States District Court for the District of Minnesota (Civil Action No. 12-cv-1984 (SRN/JJG))*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving products covering the monitoring of hospital cleaning.
- **Everlight Electronics Co. Ltd., and Emcore Corporation v. Nichia Corporation and Nichia America Corporation v. Everlight Americas, Inc.**  
*United States District Court, Eastern District of Michigan, Southern Division (Case No.4:12-cv-11758 GAD-MKM)*  
Trial and deposition testimony, expert report and declaration: commercial success, lost profits, reasonable royalty, and prejudgment interest involving patents directed to LEDs.

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**TAB 1**

- **Source Search Technologies, LLC v. Kayak.com, Inc.**  
*United States District Court, District of New Jersey (Case No. 2:11-cv-03388-FSH-MAH)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to online exchanges.
- **Universal Electronics, Inc. v. Universal Remote Control, Inc.**  
*United States District Court, Central District of California, Southern Division (Case No. SACV12-329AG (JPRx))*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to universal remotes.
- **Prowess, Inc. v. RaySearch Laboratories AB, et al.**  
*United States District Court, District of Maryland (Case No. 11 CV 1357 (WDQ))*  
Deposition testimony and expert report: lost profits, reasonable royalty and prejudgment interest involving patents directed to treatment planning software for radiation therapy.
- **JDS Therapeutics, LLC and Nutrition 21, LLC v. Pfizer Inc., Wyeth LLC, Wyeth Consumer Healthcare Ltd., and Wyeth Consumer Healthcare LLC**  
*United States District Court, Southern District of New York (Case No. 1:12-cv-09002-JSR)*  
Deposition testimony and expert report: commercial success, reasonable royalty, and unjust enrichment involving patents and trade secrets directed to the use of chromium picolinate in multi-vitamins.
- **comScore, Inc. v. Moat, Inc.**  
*United States District Court, Eastern District of Virginia, Norfolk Division (Case No. 2:12CV695-HCM/DEM, Lead Case 2:12CV351-HCM/DEM)*  
Deposition testimony and expert report: lost profits, reasonable royalty and prejudgment interest involving patents directed to online analytics.
- **Impulse Technology Ltd. v. Microsoft Corporation, Electronic Arts, Inc., Ubisoft Holdings, Inc., and Konami Digital Entertainment Inc.**  
*United States District Court, District of Delaware (Case No. 11-586-RGA-CJB)*  
Deposition testimony and expert report: reasonable royalty involving patents directed to video game motion detection functionalities.
- **LendingTree, LLC v. Zillow, Inc., NexTag, Inc., and Adchemy, Inc.**  
*United States District Court, Western District of North Carolina, Charlotte Division (Case No. 3:10-cv-439-FDW-DCK)*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty and prejudgment interest involving patents directed to internet loan matching systems.
- **Network Protection Sciences, LLC v. Fortinet, Inc.**  
*United States District Court, Northern District of California (Case No. 3:12-cv-01106-WHA)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to network security systems.
- **Shurtape Technologies, LLC and Shurtech Brands, LLC v. 3M Company**  
*United States District Court, Western District of North Carolina (Case No. 5:11-cv-00017)*  
Deposition testimony and expert report: lost profits, reasonable royalty and prejudgment interest involving patents directed to painter's tape.

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- **Abbott Biotechnology Ltd. and AbbVie, Inc. v. Centocor Ortho Biothech, Inc.**  
*United States District Court, District of Massachusetts (Case No. 09-40089-FDS)*  
Deposition testimony and expert report: lost profits, reasonable royalty and prejudgment interest involving patents directed to the treatment of rheumatoid arthritis.
- **Wi-LAN Inc. v. Alcatel-Lucent USA Inc.; Telefonaktiebolaget LM Ericsson; Ericsson Inc.; Sony Mobile Communications AB; Sony Mobile Communications (USA) Inc.; HTC Corporation; HTC America, Inc.; Exedea Inc.; LG Electronics, Inc.; LG Electronics Mobilecomm U.S.A., Inc.; and LG Electronics U.S.A., Inc.**  
*United States District Court, Eastern District of Texas (Case No. 6:10-CV-521-LED)*  
Trial and deposition testimony, affidavit, and expert report: reasonable royalty and prejudgment interest involving patents directed to wireless telecommunication systems.
- **Epos Technologies Ltd.; Dane-Elec S.A.; Dane-Elec Memory S.A.; and Dane-Elec Corporation USA v. Pegasus Technologies Ltd. and Luidia, Inc.**  
*United States District Court, District of Columbia (Case No. 07-cv-00416-WMN)*  
Deposition testimony and expert report: lost profits, reasonable royalty and prejudgment interest involving patents directed to digital pen products.
- **Life Technologies Corporation; Applied Biosystems, LLC; Institute for Protein Research; Alexander Chetverin; Helena Chetverina; and William Hone v. Illumina, Inc. and Solexa, Inc.**  
*United States District Court, Southern District of California (Case No. 3:11-cv-00703)*  
Deposition testimony and expert report: lost profits, reasonable royalty and prejudgment interest involving patents directed to DNA amplification and sequencing technology.
- **TomTom, Inc. v. Michael Adolph**  
*United States District Court, Eastern District of Virginia (Case No. 1:12-cv-528)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to automotive navigation systems.
- **Carl B. Collins and Farzin Davanloo v. Nissan North America, Inc. and Nissan Motor Co., Ltd.**  
*United States District Court, Eastern District of Texas, Marshall Division (Case No. 2:11-cv-00428-JRG)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to automotive engines.
- **I.E.E. International Electronics & Engineering, S.A. and IEE Sensing, Inc. v. TK Holdings, Inc.**  
*United States District Court, Eastern District of Michigan (Case No. 2:10-cv-13487)*  
Deposition testimony and expert report: lost profits, reasonable royalty and prejudgment interest involving patents directed to capacitive sensing used in automotive seats.
- **St. Clair Intellectual Property Consultants, Inc. v. Acer, Inc., et al./Microsoft Corporation v. St. Clair Intellectual Property Consultants, Inc.**  
*United States District Court, District of Delaware (Case No. 09-354-JJF, 09-704-JJF and 10-282-LPS)*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to power management, bus configuration and card slot technology in laptops and desktops.



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- **CardioFocus, Inc. v. Xintec Corporation (d/b/a Convergent Laser Technologies); Trimeddyne, Inc.; and Cardiogenesis Corporation**  
*United States District Court, District of Massachusetts (Case No. 1:08-cv-10285 NMG)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to laser devices used for the treatment of advanced coronary artery disease.
- **Avocent Redmond Corp. v. Raritan Americas, Inc.**  
*United States District Court, Southern District of New York (Case No. 10-cv-6100 (PKC)(JLC))*  
Deposition testimony and expert report: lost profits, lost royalties, reasonable royalty and prejudgment interest involving a patent and contract directed to software and hardware products and technologies that provide connectivity and centralized management of IT infrastructure through KVM switches.
- **Frontline Placement Technologies, Inc. v. CRS, Inc.**  
*United States District Court, Eastern District of Pennsylvania (Case No. 2:07-CV-2457)*  
Deposition testimony and expert report: lost profits, lost royalties, reasonable royalty and prejudgment interest involving a patent and contract directed to automated substitute fulfillment software.
- **Novozymes A/S and Novozymes North America, Inc. v. Danisco A/S; Genecor International Wisconsin, Inc.; Danisco US Inc.; and Danisco USA Inc.**  
*United States District Court, Western District of Wisconsin (Case No. 10-CV-251)*  
Trial and deposition testimony and expert report and expert declaration: lost profits, reasonable royalty, prejudgment interest and irreparable harm involving a patent directed to alpha-amylases used for fuel ethanol.
- **Triangle Software, LLC v. Garmin International, Inc.; Garmin USA, Inc.; TomTom, Inc.; and Volkswagen Group of America, Inc.**  
*United States District Court, Eastern District of Virginia, Alexandria Division (Case No. 1:10-CV-01457-CMH-TCB)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to providing personal navigation device functionality.
- **Northeastern University and JARG Corporation v. Google, Inc.**  
*United States District Court, Eastern District of Texas, Marshall Division (Case No. 2:07-cv-486(CE))*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to internet index and search technology.
- **Bissell Homecare, Inc. v. Dyson, Inc.**  
*United States District Court, Western District of Michigan (Case No. 1:08-cv-724)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to vacuum cleaner collection and discharge.
- **Toshiba Corporation v. Imation Corp.; Moser Baer India Ltd; Glyphics Media, Inc.; Ritek Corp.; Advanced Media, Inc.; CMC Magnetix Corp.; Hotan Corp.; and Khypermedia Corp.**  
*United States District Court, Western District of Wisconsin (Case No. 3:09-cv-00305-slc)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to DVDs.

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**TAB 1**

- **Affinity Labs of Texas, LLC. v. BMW North America, LLC, et al.**  
*United States District Court, Eastern District of Texas, Lufkin Division (Case No. 9:08-CV-00164-RC)*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to connecting a portable audio player to an automobile sound system.
- **Regents of the University of Minnesota v. AGA Medical Corp.**  
*United States District Court, District of Minnesota (Case No. 0:07-cv-04732 (PJS/RLE))*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to septal occlusion devices.
- **Ethicon Endo-Surgery, Inc. v. Hologic Inc. and Suros Surgical Systems, Inc.**  
*United States District Court, Southern District of Ohio, Western Division (Case No. 07-cv-00834)*  
Trial and deposition testimony and expert report: lost profits and reasonable royalty involving patents directed to biopsy equipment and methods, and the biopsy of soft tissue.
- **Humanscale Corp. v. CompX International, Inc. and CompX Waterloo**  
*United States District Court, Eastern District of Virginia, Richmond Division (Case No. 3:09-CV-86-JRS)*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to keyboard support mechanisms.
- **Carl Zeiss Vision GMBH and Carl Zeiss Vision International GMBH v. Signet Armorlite, Inc.**  
*United States District Court, Southern District of California (Case No. 09-CV-0657-DMS (POR))*  
Trial testimony and deposition testimony and expert report: lost profits, reasonable royalty, and lost licensing fees involving a patent directed to progressive eyeglass lenses.
- **ShopNTown LLC v. Landmark Media Enterprises, LLC**  
*United States District Court, Eastern District of Virginia, Norfolk Division (Case No. 2:08CV564)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to rental matching systems over the internet.
- **Cerner Corp. v. Visicu, Inc.**  
*United States District Court, Western District of Missouri, Western Division (Case No. 04-1033-CV-W-GAF)*  
Trial and deposition testimony and expert report: lost profits and reasonable royalty involving patents directed to electronic ICU monitoring systems.
- **Sanofi-Aventis Canada Inc.; Schering Corp.; and Sanofi-Aventis Deutschland GmbH v. Apotex/Novopharm Limited**  
*Federal Court of Canada (Case No. T-1161-07/T-161-07)*  
Trial testimony and expert report: lost profits and reasonable royalty involving a patent directed to hypertension treatment.
- **C2 Communications Technologies, Inc. v. Qwest Communications Corp; Global Crossing Telecommunications, Inc.; and Level 3 Communications, LLC**  
*United States District Court, Eastern District of Texas, Marshall Division (Case No. 2-06CV-241 TJW)*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to carrying PSTN calls via Voice over Internet Protocol.



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- **Siemens AG v. Seagate Technology**  
*United States District Court, Central District of California, Southern Division (Case No. SA CV 06-788 JVS (ANx))*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to hard disk drive technology.
- **Siemens Medical Solutions USA, Inc. v. Saint-Gobain Ceramics & Plastics, Inc.**  
*United States District Court, District of Delaware (Case No. 07-190-SLR)*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents directed to medical scanner technology.
- **Aventis Pharma, S.A. v. Baxter Healthcare Corp.**  
*Arbitration*  
Arbitration hearing and deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to hemophilia treatment.
- **Every Penny Counts, Inc. v. Bank of America Corp. and Bank of America, N.A.**  
*United States District Court, Middle District of Florida, Fort Myers Division (Case No.2:07-CV-42-FTM-29SPC)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to the Keep the Change debit card program.
- **DEKALB Genetics Corp. v. Syngenta Seeds, Inc.; Golden Harvest Seeds, Inc.; Sommer Bros. Seed Co.; JR Robinson Seeds, Inc.; and Garst Seed Co.**  
*United States District Court, Eastern District of Missouri (Case No.4:06CV01191MLM)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to genetically modified corn.
- **International Flora Technologies, Ltd. v. Clarins U.S.A.**  
*United States District Court, District of Arizona (Case No.2:06-CV-01371-ROS)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to skin care products.
- **Howmedica Osteonics Corp. v. Zimmer, Inc.; Centerpulse Orthopedics, Inc. (formerly known as Sulzer Orthopedics, Inc.); and Smith & Nephew, Inc.**  
*United States District Court, District of New Jersey (Case No.05-0897 (WHW))*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to hip implant technology.
- **Elan Pharma International, Ltd. v. Abraxis Bioscience, Inc.**  
*United States District Court, District of Delaware (Case No.06-438-GMS)*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to nanotechnology drug delivery.
- **Mobile Micromedia Solutions LLC v. Nissan North America, Inc.**  
*United States District Court, Eastern District of Texas, Texarkana Division (Case No.505-CV-230)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to automotive entertainment systems.

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**TAB 1**

- **Nichia Corp. v. Seoul Semiconductor, Ltd. and Seoul Semiconductor, Inc.**  
*United States District Court, Northern District of California (Case No. 3:06-CV-00162-MMC (JCS))*  
Trial and deposition testimony and expert report: reasonable royalty, unjust enrichment, and prejudgment interest involving patents directed to light emitting diodes.
- **NetRatings, Inc. v. WebSideStory, Inc.**  
*United States District Court, Southern District of New York (Case No. 06-CV-878(LTS)(AJP))*  
Deposition testimony and expert report: reasonable royalty involving technology directed to internet audience measurement and analysis.
- **Ernest K. Manders, M.D. v. McGhan Medical Corp.**  
*United States District Court, Western District of Pennsylvania (Case No. 02-CV-1341)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to implantable tissue expanders.
- **Source Search Technologies, LLC v. LendingTree, Inc.; IAC/InterActiveCorp; and ServiceMagic, Inc.**  
*United States District Court, District of New Jersey (Case No. 2:04-CV-4420)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to online exchanges.
- **The Boeing Co. v. The United States**  
*United States Court of Federal Claims (Case No. 00-705 C)*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to a process for aging aluminum lithium alloys used for space shuttle external tanks.
- **Bridgestone Sports Co., Ltd. and Bridgestone Golf, Inc. v. Acushnet Co.**  
*United States District Court, District of Delaware (Case No. 05-132-(JJF))*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to cores, intermediate layers and covers of golf balls.
- **Dyson Technology Ltd. and Dyson, Inc. v. Maytag Corp.**  
*United States District Court, District of Delaware (Case No. 05-434-GMS)*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to upright cyclonic vacuum cleaners.
- **Verizon Services Corp. and Verizon Laboratories, Inc. v. Vonage Holdings Corp. and Vonage America, Inc.**  
*United States District Court, Eastern District of Virginia (Case No. 1:06CV682)*  
Trial and deposition testimony and expert report: permanent injunction, lost profits, and reasonable royalty involving patents directed to a voice over internet protocol (“VoIP”) platforms.
- **Hitachi, LTD v. BorgWarner, Inc.**  
*United States District Court, District of Delaware (Case No. 05-048-SLR)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to automotive cam shaft technology.
- **Innogenetics N.V. v. Abbott Laboratories**  
*United States District Court, Western District of Wisconsin (Case No. 05-C-0575-C)*  
Trial and deposition testimony and expert report: reasonable royalty involving a patent directed to HCV genotyping.

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- **O2 Micro International v. Monolithic Power Systems, Inc.**  
*United States District Court, Northern District of California (Case No. 04-02000 CW; 06-02929 CW)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to AC to DC power converter circuits used for backlights.
- **Solvay Solexis, Inc. v. 3M Co.; 3M Innovative Properties Co.; and Dyneon LLC**  
*United States District Court, District of New Jersey (Case No. 04-06162 (FSH/PS))*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to low temperature fluoroelastomers.
- **Target Technology Co., LLC v. Williams Advanced Materials, Inc., et al.**  
*United States District Court, Central District of California (Case No. SACV04-1083 DOC (MLGx))*  
Deposition testimony and expert report: reasonable royalty and design-around alternatives involving a patent directed to silver alloy sputtering targets for DVDs.
- **Metrollogic Instruments, Inc. v. Symbol Technologies, Inc.**  
*United States District Court, District of New Jersey (Case No. 03cv2912 (HAA))*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to bar code scanners.
- **Eaton Corp. v. ZF Meritor, LLC**  
*United States District Court, Eastern District of Michigan (Case No. 03-74844)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to truck clutches and transmissions.
- **Meritor Transmission Corp. v. Eaton Corp.**  
*United States District Court, Western District of North Carolina (Case No. 1:04-CV-178)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to truck transmissions.
- **Monsanto Co. v. Syngenta Seeds, Inc.**  
*United States District Court, District of Delaware (Case No. 04-305-SLR)*  
Deposition testimony and expert report: reasonable royalty involving patents directed to genetically modified corn seed.
- **Indiana Mills & Manufacturing, Inc. v. Dorel Industries, Inc.**  
*United States District Court, Southern District of Indiana (Case No. 1:04-CV-1102)*  
Deposition testimony and expert report: damages and profits associated with alleged contract breach and patent infringement involving technology directed to automobile child restraint systems.
- **Paice LLC v. Toyota Motor Corp.**  
*United States District Court, Eastern District of Texas, Marshall Division (Case No. 2-04CV-211) (DF)*  
Deposition testimony and expert report: reasonable royalty involving patents directed to hybrid-electric powertrain systems.
- **GTECH Corp. v. Scientific Games International**  
*United States District Court, District of Delaware (Case No. 04-0138)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents directed to a system and method for distributing lottery tickets.

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- **WEDECO UV Technologies, Inc. v. Calgon Carbon Corp.**  
*United States District Court, District of New Jersey (Case No. 01-924)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents directed to treatment of potable water with UV light.
- **Khyber Technologies Corp. v. Casio, Inc; Everex Systems, Inc.; Hewlett-Packard Co.; and Hewlett-Packard Singapore PTE. LTD.**  
*United States District Court, District of Massachusetts (Case No. 99-CV-12468-GAO)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to audio playback for portable electronic devices.
- **Air Liquide America, L.P. v. P.H. Glatfelter Co.**  
*United States District Court, Middle District of Pennsylvania (Case No. 1:CV-04-0646)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to the use of ozone bleaching of pulp.
- **Gary J. Colassi v. Cybex International, Inc.**  
*United States District Court, District of Massachusetts (Case No. 02-668-JEL/JGL)*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to treadmill support decks.
- **Medinol Ltd. v. Guidant Corp. and Advanced Cardiovascular Systems, Inc.**  
*United States District Court, Southern District of New York (Case No. 03 C iv.2604 (SAS))*  
Deposition testimony and expert report: reasonable royalty analysis and prejudgment interest involving patents directed to connectors for coronary and peripheral stents.
- **Donner, Inc. v. American Honda Motor Co.; McDavid Plano-Acura, L.P.; and The Beaumont Co.**  
*United States District Court, Eastern District of Texas, Texarkana Division (Case No.F:03-CV-253)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to automobile entertainment systems.
- **Nonin Medical, Inc. v. BCI, Inc.**  
*United States District Court, Fourth Division of Minnesota (Case No.02-668-JEL/JGL)*  
Deposition testimony and expert report: reasonable royalty, lost profits, and prejudgment interest involving patents directed to finger clip pulse oximeters.
- **Stryker Trauma S.A. and Howmedica Osteonics Corp. v. Synthes (USA)**  
*United States District Court, District of New Jersey (Case No.01-CV 3879 (DMC))*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to snap-fit external fixation systems.
- **Michael Foods, Inc. and North Carolina State University v. Rose Acre Farms, Inc.**  
*United States District Court, Eastern District of North Carolina Western Division (Case No.5:02-CV-477-H(3))*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents directed to extended shelf life eggs.

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- **Waters Technologies Corp.; Waters Investments, Ltd.; Micromass UK Ltd.; and Micromass, Inc. v. Applera Corp.**  
*United States District Court, District of Delaware (Case No.02-1285-GMS)*  
Deposition testimony and expert report: lost profits, price erosion, reasonable royalty, and prejudgment interest involving a patent directed to mass spectrometer ionization sources.
- **Medtronic Sofamor Danek, Inc. v. Gary K. Michelson, M.D. and Karlin Technology, Inc.**  
*United States District Court, Western District of Tennessee (Case No. 01-2373 GV)*  
Trial and deposition testimony and expert report: damages and profits associated with alleged contractual breaches, tortious interference and intentional negligent representations involving spinal implants.
- **Matsushita Electric Industrial Co. Ltd. v. Cinram International, Inc.**  
*United States District Court, District of Delaware (Case No.01-882-SLR)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest covering patents directed to aspects of bonding substrates together to form optical discs, such as DVDs.
- **Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp. and Schering Corp.**  
*United States District Court, District of New Jersey (Case No. 96-CV-04047)*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty, price erosion, and prejudgment interest involving a patent directed to porcine vaccine (PRRS) products.
- **Arris International and Randall A. Holliday v. John Mezzalingua and Associates, Inc. d/b/a PPC**  
*United States District Court, District of Colorado (Case No. 01-WM-2061)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to coaxial cable connectors.
- **Promega Corp. v. Applera Corp.; and Lifecodes Corp., and its Subsidiaries Cellmark Diagnostics, Inc.; and Genomics International Corp.**  
*United States District Court, Western District of Wisconsin (Case No. 01-C-0244-C)*  
Deposition testimony and expert report: lost profit rate, reasonable royalty, and prejudgment interest involving a patent directed to DNA sequencing technology.
- **Alcon Laboratories, Inc. and Alcon Manufacturing, Ltd. v. Pharmacia Corp.; Pharmacia & Upjohn Co.; and The Trustees of Columbia University in the City of New York**  
*United States District Court, Southern District of New York (Case No. 01-Civ.2989 (WHP))*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to compositions for treatment of glaucoma.
- **Pharmacia Corp.; Pharmacia AB; Pharmacia Enterprises S.A.; and Pharmacia & Upjohn Co. v. Alcon Laboratories, Inc.**  
*United States District Court, Southern District of New York (Case No. 01-070-SLR)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to compositions for treatment of glaucoma.
- **Takata Corp. v. AlliedSignal, Inc. and Breed Technologies, Inc.**  
*United States District Court, District of Delaware (Case No. 98-94-MMS)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest covering patents and trade secrets directed to seatbelt retractors.

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- **Chiron Corp. v. Genentech, Inc.**  
*United States District Court, Eastern District of California (Case No. S-00-1252 WBS GGH)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest covering a patent directed to the active ingredient in an anti-cancer drug.
- **Greene, Tweed of Delaware, Inc. v. DuPont Dow Elastomers, LLC**  
*United States District Court, Eastern District of Pennsylvania (Case No. 00-CV-3058)*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent covering perfluorelastomeric seals used in semiconductor fabrication applications.
- **Streck Laboratories v. Beckman Coulter, Inc.**  
*United States District Court, District of Nebraska (Case No. 8:99CV473)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents covering hematology testing equipment.
- **Adobe Systems Inc. v. Macromedia, Inc.**  
*United States District Court, District of Delaware (Case No. 00-743-JJF)*  
Trial and deposition testimony and expert report: reasonable royalty involving patents covering computer video and audio software.
- **Dictaphone Corp. v. Nice Systems, Ltd.**  
*United States District Court, District of Connecticut (Case No. 3:00-CV-1143)*  
Deposition testimony and expert report: lost profits, price/margin erosion, reasonable royalty, and prejudgment interest involving patents covering digital logger systems.
- **Metrologic Instruments, Inc. v. PSC, Inc.**  
*United States District Court, District of New Jersey (Case No. 99-CV-04876)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents covering bar code scanning equipment.
- **Genzyme Corp. v. Atrium Medical Corp.**  
*United States District Court, District of Delaware (Case No. 00-958-RRM)*  
Trial testimony and expert report: lost profits and price/margin erosion involving patents covering chest drainage systems.
- **Norian Corp. v. Stryker Corp.**  
*United States District Court, Northern District of California (Case No. C-01-0016 (WHA))*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent covering bone cement.
- **John Mezzalingua Associates, Inc., d/b/a PPC v. Antec Corp.**  
*United States District Court, Middle District of Florida (Case No. 3:01-CV-482-J-25 HTS)*  
Deposition testimony and expert report: disgorgement of profits involving a design patent covering a coaxial cable connection.
- **Rockwell Automation Technologies, LLC v. Spectra-Physics Lasers, Inc. and Opto Power Corp.**  
*United States District Court, District of Delaware (Case No. 00-589-GMS)*  
Deposition testimony and expert report: reasonable royalty involving a patent covering a process for producing semiconductor epitaxial films.



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- **Tanashin Denk Co., Ltd. v. Thomson Consumer Electronics, Inc.**  
*United States District Court, Southern Division of Indiana (Case No. IP 99-836-C Y/G)*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents covering cassette tape drives.
- **Medtronic Sofamor Danek, Inc. et al. v. Osteotech**  
*United States District Court, Western Division of Tennessee (Case No.99-2656-GV)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents covering the instruments and method of inserting a spinal inter-body fusion device.
- **Heimann Systems GmbH v. American Science and Engineering, Inc.**  
*United States District Court, District of Connecticut (Case No. 00 CV 10276 (WGY))*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to mobile X-ray examining apparatus.
- **Omega Engineering, Inc. v. Cole-Parmer Instrument Co.; Davis Instrument Manufacturing Co., Inc.; Dwyer Instruments, Inc.; and Raytek Corp.**  
*United States District Court, District of Connecticut (Case Nos.3:98 CV 00733 (JCH), 3:98 CV 02052 (JCH) and 3:98 CV 02276 (JCH))*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents and alleged unfair competitive practices directed to portable infrared thermometers.
- **Particle Measuring Systems, Inc. v. Rion Co., Ltd.**  
*United States District Court, District of Colorado (Case No.99-WM-1433)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to a device and method for optically detecting particles in fluid.
- **The University of Colorado Foundation Inc., et al. v. American Cyanamid Co.**  
*United States District Court, District of Colorado (Case No.93-K-1657)*  
Trial and deposition testimony and expert report: measure and amount of prejudgment interest in a patent infringement, fraud and unjust enrichment case covering prenatal vitamin formulations.
- **Gleason Works v. Oerlikon Geartec AG and Liebherr-America, Inc.**  
*United States District Court, Western District of New York (Case No.98-CV-6275 L)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to bevel gear-cutting machines.
- **Amersham Pharmacia v. PE Corp.**  
*United States District Court, Northern District of California (Case No. C 97-04203-TEH)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to a method of using energy transfer reagents in a DNA sequencing system.
- **Ziarno v. The American Red Cross, et al.**  
*United States District Court, Northern District of Illinois (Case No. 99 CIV 3430)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to online/internet fundraising.

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- **Applied Medical Resources Corp. v. Core Dynamics, Inc.**  
*United States District Court, Central District of California (Case No. SACV 99-748-DOC (ANx))*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to surgical trocars.
- **Bell Communications Research, Inc. v. Fore Systems, Inc.**  
*United States District Court, District of Delaware (Case No. 98-586 JJF)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest covering patents directed to telecommunications technology (ATM over SONET networks).
- **Newell Operating Co. (EZ Painter Co.) v. Linzer Products Corp.**  
*United States District Court, Eastern District of Wisconsin (Case No. 98-C-0864)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest covering a patent directed to a method for manufacturing polypropylene paint roller covers.
- **Dow Chemical Co. v. Sumitomo Chemical Co., Ltd. and Sumitomo Chemical America, Inc.**  
*United States District Court, Eastern District of Michigan (Case No. 96-10330-BC)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest covering a patent directed to a method for manufacturing cresol epoxy novalac resins used in integrated circuit encapsulation.
- **Insight Development Corp. v. Hewlett-Packard Co.**  
*United States District Court, Northern District of California (Case No. C 98 3349 CW)*  
Deposition testimony and expert report: damages and profits associated with alleged contract breaches, patent, copyright and trade secret misappropriation/infringement and unfair competition involving digital image processing and transmission, including that over the internet.
- **Bristol-Myers Squibb Co. v. Rhone-Poulenc Rorer Inc. and Centre National De La Recherche Scientifique**  
*United States District Court, Southern District of New York (Case No. 95 Civ. 8833)*  
Deposition testimony and expert report: reasonable royalty covering a patent directed to semi-synthetic processes for manufacturing an anti-cancer drug.
- **Pactiv Corp. v. S.C. Johnson & Son, Inc.**  
*United States District Court, Northern District of Illinois (Case No. 98 C 2679)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to zipper closure mechanisms for home storage bags.
- **Dr. Harry Gaus v. Conair Corp.**  
*United States District Court, Southern District of New York (Case No. 94-5693 (KTD) (FM))*  
Trial and deposition testimony and expert report: reasonable royalty and prejudgment interest covering a patent directed to hazard prevention devices used with electrical hair dryers.
- **Neogen Corp. v. Vicam, L.P., et al.**  
*United States District Court, Middle District of Florida (Case No. 97-405-CIV-T-23B)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest covering a patent and a variety of tort claims directed to aflatoxin testing equipment.
- **Surety v. Entrust**  
*United States District Court, Eastern District of Virginia (Case No. 99-203-A)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest covering a patent directed to digital time stamping.



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- **Sofamor Danek Holdings, Inc., et al. v. United States Surgical Corp., et al.**  
*United States District Court, Western District of Tennessee (Case No. 98-2369 GA)*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent covering the method of inserting a spinal inter-body fusion device.
- **Molten Metal Equipment Innovation, Inc. v. Metaullics**  
*United States District Court, Northern District of Ohio (1:97-CV2244)*  
Trial testimony and expert report: lost profits, reasonable royalty, and prejudgment interest covering a patent directed to submersible molten metal pumps.
- **AcroMed Corp. v. Sofamor Danek Group, Inc.**  
*United States District Court, Northern District of Ohio (Case No. 1:93-CV01184)*  
Trial and deposition testimony and expert report: lost profits and prejudgment interest involving patents directed to spinal implant devices.
- **BIC Corp. v. Thai Merry Co., Ltd.**  
*United States District Court, Central District of California (Case No. 98 CIV. 2113 (DLC))*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to disposable cigarette lighters.
- **Syncsort Inc. v. Michael Wagner; Cambridge Algorithm; ICF Kaiser Intl. Inc., et al.**  
*United States District Court, Northern District of Georgia (Case No. 1:93-CV-2247-JEC)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to data sorting software.
- **Shell Oil Co. v. ICI Americas, Inc. and P.E.T Processors, LLC**  
*United States District Court, Eastern District of Louisiana (Case No. 97-3526 Section "K")*  
Deposition testimony and expert report: lost profits and reasonable royalty involving a patent directed to a process to manufacture solid stated polyethylene naphthalene.
- **Pall Corp. v. Hemasure Inc. and Lydall, Inc.**  
*United States District Court, Eastern District of New York (Case No. CV-96-436 (TCP/ETB), Case No. 96-5620 (LDW/VVP))*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents directed to prestorage leukodepletion devices.
- **Mentor H/S, Inc. v. Medical Device Alliance, Inc.; Lysonix, Inc.; and Misonix, Inc.**  
*United States District Court, Central District of California (Case No. CV97-2431 WDK (BQRx))*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to ultrasonic liposuction.
- **Hyundai Electronics Industries Co., Ltd. v. NEC Corp. and NEC Electronics, Inc.**  
*United States District Court, Eastern District of Virginia (Case No. 97-2030A, Case No. 97-2031A, Case No. 98-118-A)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to semiconductor technology.
- **Hitachi, LTD. v. Samsung Display Devices Co., LTD.; Samsung Display Devices, Inc.; Samsung Electronics Co., LTD.; Samsung Electronics America, Inc.; and Office Depot, Inc.**  
*United States District Court, Eastern District of Virginia (Case No. 97-1988-A)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving patents directed to various aspects of cathode ray tubes.

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- **Stairmaster Sports/Medical Products, a Limited Partnership v. Groupe Procycle, Inc. and Procycle USA, Inc.**  
*United States District Court, District of Delaware (Case No. 97-396 MMS)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to stair climbing fitness equipment.
- **Angelo Mongiello's Children, LLC v. Pizza Hut, Inc.**  
*United States District Court, Eastern District of New York (Case No. 95 CV 4601)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest involving a patent directed to a method for forming pizza shells.
- **BTG v. Magellan Corp.; BTG v. Trimble Navigation**  
*United States District Court, Eastern District of Pennsylvania (Case No. 96-CV-7551/Case No. 96-CV-5084 (HB))*  
Deposition testimony and expert reports: reasonable royalty, prejudgment interest, value of inventory on hand, preparation and investments made and business commenced (as of patent reissuance) involving a patent directed to secret or secure communications technology employed in global positioning system products.
- **Micro Chemical, Inc. v. Lextron, Inc.**  
*United States District Court, District of Colorado (Case No. 88-Z-499)*  
Trial and deposition testimony and expert report: lost profits, price erosion, reasonable royalty, and prejudgment interest involving a patent directed to feed additive weigh/mix dispensing machines.
- **Thai Merry Co., Ltd.; Honson Marketing Group, Inc.; and Calico Brands, Inc. v. BIC Corp.**  
*United States District Court, Central District of California (Case No. 96-5256 WJR (BQRx))*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents directed to child-resistant disposable cigarette lighters.
- **Radco, Inc. v. Shell Oil Co.; Foster Wheeler USA Corp.; Lyondell-Citgo Refining Co., LLC; Petro-Chem Development Co. Inc.; and Marathon Oil Co.**  
*United States District Court, Northern District of Oklahoma (Case No. 93-C 1102)*  
Deposition testimony and expert report: reasonable royalty involving a patent directed to coker heater refinery equipment.
- **Beloit Corp. v. Valmet Corp., et al.**  
*United States District Court, Western District of Wisconsin (Case No. 96-C-0087-C)*  
Trial testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents directed to the dryer section of paper making machines.
- **Burke, Inc. v. Everest & Jennings, Inc. et al./Burke, Inc. v. Invacare Corp.**  
*United States District Court, California Central District (Case No. 89-2613 (KMW)/Case No. 90-787 (KMW))*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest over a patent directed to three wheel motorized scooter technology.
- **Bauer Inc. v. Rollerblade, Inc.**  
*United States District Court, Eastern District of Virginia (Case No. 96-952-A)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to a hybrid stitched and molded skate boot design.

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- **Mettler - Toledo A.G. v. Denver Instrument Co., et al.**  
*United States District Court, Eastern District of Virginia (Case No. 95-1055-A)*  
Deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving patents directed to analytical and precision balances.
- **Bristol-Myers Squibb Co. v. Abbott Laboratories**  
*United States District Court, Southern District of Indiana (Case No. EV 94-56-C)*  
Trial and deposition testimony and expert report: reasonable royalty involving a patent directed to a guiding device used in enteral delivery set assemblies.
- **Crown Equipment Corp. v. The Raymond Corp.**  
*United States District Court, Northern District of Ohio (Case No. 3:93CV7356)*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty, and prejudgment interest involving a patent directed to lift truck technology.
- **Mitsubishi Kasei Corp.; and Mitsubishi Kasei America, Inc. v. Virgle Hedgcoth; and Mertec Licensing Technology**  
*United States District Court, Northern District of California (Case No. 94-1971 SAW (JSB))*  
Deposition testimony and expert report: reasonable royalty involving a patent directed to sputtered rigid disks used in personal computers.
- **Travelers Express Co. Inc. v. The Standard Register Co.**  
*United States District Court, District of Minnesota (Case No. 4-93-436)*  
Deposition testimony and expert report: lost profits, reasonable royalty, patent misuse, and prejudgment interest involving patents directed to money order dispensers.
- **Dow Chemical Co. v. The United States**  
*Court of Federal Claims (Case No. 19-83C)*  
Trial and deposition testimony: measure and amount of delay compensation in an eminent domain case over the taking of a patent directed to the back - filling of abandoned coal mines.

**Patent Cases – Injunctive Relief**

- **Koninklijke Philips Electronics N.V. and Philips Electronics North America Corporation v. ZOLL Medical Corporation**  
*United States District Court, District of Massachusetts (Case No. 1:10-cv-11041)*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty damages, and prejudgment interest related to alleged patent infringement involving external defibrillators.
- **Syngenta Crop Protection, LLC v. Willowood, LLC, Willowood USA, LLC, Willowood Azoxystrobin, LLC, and Willowood Limited**  
*US District Court, Middle District of North Carolina (Case No. 1:15-cv-274)*  
Trial and deposition testimony and expert report: damages and prejudgment interest related to alleged patent and copyright infringement involving crop fungicide.
- **Fresenius Kabi USA, LLC v. Fera Pharmaceuticals, LLC and Oakwood Laboratories, LLC**  
*United States District Court, District of New Jersey (Case No. 15-03654-KM-MAH)*  
Deposition testimony and expert declarations: antitrust liability and damages; commercial success and preliminary injunctive relief involving patents directed to injectable drug treatment of myxedema coma.

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- **Dominion Resources, Inc., and Virginia Electric and Power Company v. Alstom Grid, Inc.**  
*United States District Court, Eastern District of Pennsylvania*  
Trial and deposition testimony and expert report: permanent injunction involving patents directed to a system and process that dynamically samples smart meters in order to achieve voltage optimization.
- **Integra Lifesciences Corporation, Integra Lifesciences Sales, LLC, Confluent Surgical, Inc., and Incept, LLC v. Hyperbranch Medical Technology, Inc.**  
*United States District Court, District of Delaware (Case No. 15-cv-00819)*  
Trial and deposition testimony and expert reports: lost profits, price erosion, reasonable royalty, prejudgment interest, preliminary relief, and commercial success involving patents directed to cranial and spinal dural repair sealants.
- **Antares Pharma, Inc. v. Medac Pharma, Inc., Medac GmbH, Becton Dickinson France S.A.S., and Becton, Dickinson and Company**  
*United States District Court, District of Delaware (C.A. No. 14-270-SLR)*  
Deposition testimony and expert report: irreparable harm, balance of hardships, and public interest involving patents directed to methotrexate autoinjector products.
- **Delavau, LLC v. J.M. Huber Corporation and J.M. Huber Micropowders Inc.**  
*United States District Court, District of New Jersey (Case No. 12-05378 (ES)(SCM))*  
Deposition testimony and expert declaration: preliminary injunctive relief involving patents directed to dietary calcium supplements.
- **Dyson Technology Limited and Dyson, Inc. v. Cornucopia Products, LLC**  
*United States District Court, District of Arizona (Case No. 2:12-cv-00924-ROS)*  
Hearing testimony and expert declaration: irreparable harm involving patents directed to bladeless fans.
- **Novozymes A/S and Novozymes North America, Inc. v. Danisco A/S; Genecor International Wisconsin, Inc.; Danisco US Inc.; and Danisco USA Inc.**  
*United States District Court, Western District of Wisconsin (Case No. 10-CV-251)*  
Trial and deposition testimony and expert report and expert declaration: lost profits, reasonable royalty, prejudgment interest and irreparable harm involving a patent directed to alpha-amylases used for fuel ethanol.
- **LifeWatch Services, Inc. and Card Guard Scientific Survival, LTD. v. Medicomp, Inc. and United Therapeutics Corp.**  
*United States District Court, Middle District of Florida, Orlando Division (Case No. 6:09-cv-1909-Orl-31DAB)*  
Hearing and deposition testimony and expert declaration: preliminary injunctive relief involving patents directed to ambulatory arrhythmia monitoring solutions.
- **Verizon Services Corp. and Verizon Laboratories, Inc. v. Vonage Holdings Corp. and Vonage America, Inc.**  
*United States District Court, Eastern District of Virginia (Case No. 1:06CV682)*  
Trial and deposition testimony and expert report: permanent injunction, lost profits and reasonable royalty involving patents directed to a voice over internet protocol (“VoIP”) platforms.

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- **Riverwood International Corp. v. MeadWestvaco Corp.**  
*United States District Court, Northern District of Georgia (Case No.1:03-CV-1672 (TWT))*  
Deposition testimony and expert report: irreparable harm involving a patent directed to 2x6 beverage cartons.

**Patent Cases – Commercial Success**

- **Valeant Pharmaceuticals International, Inc., Salix Pharmaceuticals, Inc., Progenics Pharmaceuticals, Inc., and Wyeth LLC v. Mylan Pharmaceuticals, Inc., Mylan Laboratories Ltd., Mylan, Inc., and Actavis LLC**  
*United States District Court, District of New Jersey (Case No. 2:15-08180 (SRC)(CLW))*  
Deposition testimony and expert report: commercial success covering patents directed to treatment of opioid induced constipation (“OIC”) indications.
- **Eli Lilly and Company v. Teva Pharmaceuticals USA, Inc.**  
*United States District Court, Southern District of Indiana, Indianapolis Division (Case No. 16-cv-596)*  
Deposition testimony and expert report: commercial success covering a patent directed to treatment of postmenopausal osteoporosis.
- **Integra Lifesciences Corporation, Integra Lifesciences Sales, LLC, Confluent Surgical, Inc., and Incept, LLC v. Hyperbranch Medical Technology, Inc.**  
*United States District Court, District of Delaware (Case No. 15-cv-00819)*  
Trial and deposition testimony and expert reports: lost profits, price erosion, reasonable royalty, prejudgment interest, preliminary relief, and commercial success involving patents directed to cranial and spinal dural repair sealants.
- **VIVUS, Inc. v. Actavis Laboratories FL, Inc.**  
*United States District Court, District of New Jersey (Case No. 14-cv-3786-SRC-CLW; 15-cv-1636-SRC-CLW; and 15-CV-02693-SRC-CLW)*  
Deposition testimony and expert reports: commercial success involving patents directed to an immediate release/extended release combination drug used for chronic weight management.
- **Fresenius Kabi USA, LLC v. Fera Pharmaceuticals, LLC and Oakwood Laboratories, LLC**  
*United States District Court, District of New Jersey (Case No.15-03654-KM-MAH)*  
Deposition testimony and expert declarations: antitrust liability and damages; commercial success and preliminary injunctive relief involving patents directed to injectable drug treatment of myxedema coma.
- **In the Matter of Certain Magnetic Data Storage Tapes and Cartridges Containing the Same (Sony Corporation, Sony Corporation of America, and Sony Electronics, Inc. (Respondents))**  
*United States International Trade Commission (Inv. No. 337-TA-1012)*  
Trial and deposition testimony and expert report: economic evaluation of FRAND, commercial success, bond, remedy, domestic industry, and public interest issues involving patents directed to certain magnetic data storage tapes and cartridges.
- **Noven Pharmaceuticals, Inc. v. Actavis Laboratories UT, Inc.**  
*United States District Court, District of Delaware (Case No. 15-249 (LPS))*  
Trial and deposition testimony and expert report: commercial success involving patents directed to an estrogen therapy patch.

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- **Sebela International, Ltd. v. Actavis Laboratories FL, Inc., Actavis Pharma, Inc., Andrx Corp., and Actavis, Inc.; Sebela International Ltd. v. Prinston Pharmaceutical, Inc., Solco Healthcare U.S., LLC, and Huahai US, Inc.**  
*United States District Court, District of New Jersey (Case No. 14-cv-06414 (CCC-JBC) and 14-cv-07400 (CCC-JBC); consolidated with Case No. 15-cv-05308)*  
Trial and deposition testimony and expert report: commercial success involving patents directed to a non-hormonal product indicated for the treatment of moderate to severe vasomotor symptoms (“VMS”) associated with menopause.
- **Meda Pharmaceuticals, Inc. and Cipla, Ltd. v. Apotex, Inc. and Apotex Corp.**  
*United States District Court, District of Delaware (Case No. 14-1453-LPS)*  
Trial and deposition testimony and expert declaration: commercial success involving patents directed to a combination formulation drug used to treat seasonal allergic rhinitis.
- **Arctic Cat, Inc., v. Polaris Industries, Inc.**  
*The United States Patent and Trademark Office (Cases IPR2015-01781; IPR2015-01783)*  
Deposition testimony and expert declaration: commercial success involving patents directed to side-by-side all-terrain vehicles.
- **Innopharma Inc., Mylan Pharmaceuticals, Inc., et al. v. Senju Pharmaceutical Co., Ltd., Bausch & Lomb, Inc., and Bausch & Lomb Pharma Holdings Corp.**  
*The United States Patent and Trademark Office (Case Nos. IPR2015-00902 and IPR2015-00903)*  
Deposition testimony and expert declaration: commercial success involving patents directed to nonsteroidal anti-inflammatory drugs (“NSAIDs”) used to treat post-cataract surgery inflammation and pain.
- **Lupin Ltd. and Lupin Pharmaceuticals, Inc. v. Senju Pharmaceutical Co., Ltd.**  
*The United States Patent and Trademark Office (Case Nos. IPR2015-01097; IPR2015-01105; IPR2015-01099; and IPR2015-01100)*  
Deposition testimony and expert declaration: commercial success involving patents directed to nonsteroidal anti-inflammatory drugs (“NSAIDs”) used to treat post-cataract surgery inflammation and pain.
- **Senju Pharmaceutical Co., Ltd., Bausch & Lomb, Inc., and Bausch & Lomb Pharma Holdings Corp. v. Innopharma Inc., Lupin Pharmaceuticals, Inc., et al.**  
*United States District Court, District of New Jersey (Case Nos. 14-cv-00667-JBS-KMW; 14-cv-04149-JBS-KMW; 14-cv-05144-JBS-KMW; 15-cv-00335-JBS-KMW; 14-cv-06893-JBS-KMW; and 15-cv-03240-JBS-KMW)*  
Deposition testimony and expert declaration: commercial success involving patents directed to nonsteroidal anti-inflammatory drugs (“NSAIDs”) used to treat post-cataract surgery inflammation and pain.
- **Arctic Cat, Inc., v. Polaris Industries, Inc.**  
*The United States Patent and Trademark Office (Case IPR2014-01427)*  
Deposition testimony and expert declaration: commercial success involving patents directed to side-by-side all-terrain vehicles.



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- **Intendis GmbH, Intraseriv GmbH & Co. KG and Bayer Healthcare Pharmaceuticals Inc., v. Glenmark Generics Ltd. and Glenmark Generics Inc., USA.**  
*United States District Court, District of Delaware (Case No. 13-cv-421-SLR)*  
Trial and deposition testimony and expert report: commercial success involving a patent directed to the treatment of certain skin diseases.
- **Everlight Electronics Co. Ltd., and Emcore Corporation v. Nichia Corporation and Nichia America Corporation v. Everlight Americas, Inc.**  
*United States District Court, Eastern District of Michigan, Southern Division (Case No.4:12-cv-11758 GAD-MKM)*  
Trial and deposition testimony, expert report and declaration: commercial success, lost profits, reasonable royalty, and prejudgment interest involving patents directed to LEDs.
- **Bayer Healthcare Pharmaceuticals, Inc. and Dow Pharmaceutical Sciences, Inc. v. River's Edge Pharmaceuticals, LLC, Teresina Holdings, LLC, Medical Products Laboratories, Inc. and Stayma Consulting Services, LLC**  
*United States District Court, Northern District of Georgia, Atlanta Division (Case No.11-cv-01634-RLV)*  
Deposition testimony and expert report: commercial success involving a patent directed to the treatment of certain skin diseases.
- **JDS Therapeutics, LLC and Nutrition 21, LLC v. Pfizer Inc., Wyeth LLC, Wyeth Consumer Healthcare Ltd., and Wyeth Consumer Healthcare LLC**  
*United States District Court, Southern District of New York (Case No.1:12-cv-09002-JSR)*  
Deposition testimony and expert report: commercial success, reasonable royalty, and unjust enrichment involving patents and trade secrets directed to the use of chromium picolinate in multi-vitamins.
- **Ferring, B.V. v. Watson Laboratories, Inc. – Florida, Apotex Inc., and Apotex Corp.**  
*United States District Court, District of Nevada (Case Nos.3:11-cv-00481-RCJ-VPC, 3:11-cv-00485-RCJ-VPC, 3:11-cv-00853-RCJ-VPC, 3:11-cv-00854-RCJ-VPC, 2:12-cv-01935-RCJ-VPC, and 2:12-cv-01941-RCJ-VPC)*  
Deposition testimony and expert report: commercial success involving patents directed to the treatment of menorrhagia.
- **Medicis Pharmaceutical Corporation; Dow Pharmaceutical Sciences, Inc.; and Alyzan, Inc. v. Actavis Mid Atlantic LLC**  
*United States District Court, District of Delaware (Case No. 11-CV-409)*  
Deposition testimony and expert report: commercial success involving a patent directed to delivery vehicles for treatment of dermatological disorders.
- **Galderma Laboratories, L.P.; Galderma S.A.; and Galderma Research & Development, S.N.C. v. Tolmar Inc.; and Actavia Mid Atlantic LLC**  
*United States District Court, District of Delaware (Case No. 10-cv-45 (LPS))*  
Trial and deposition testimony and expert report: commercial success involving a patent directed to treatment of dermatological disorders.

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- **Pronova Biopharma Norge AS v. Teva Pharmaceuticals USA, Inc.; Apotex Corp. and Apotex Inc.; Par Pharmaceutical, Inc.; and Par Pharmaceutical Companies, Inc.**  
*United States District Court, District of Delaware (Case Nos. 09-286-SLR/09-304-SLR/09-305-SLR-MPT)*  
Trial and deposition testimony and expert report: commercial success covering patents directed to treatment of HDL cholesterol and hypertriglyceridemia.
- **Eli Lilly and Company v. Wockhardt Limited and Wockhardt USA, Inc.**  
*United States District Court, District of Indiana, Indianapolis Division (Case No. 1:08-cv-1547-WTL-TAB)*  
Deposition testimony and expert report: commercial success covering a patent directed to treatment of depression, anxiety and pain.
- **Acorda Therapeutics, Inc. v. Apotex Inc. and Apotex Corp.**  
*United States District Court, District of New Jersey (Case No. 2:07-cv-04937-JAG-MCA)*  
Trial and deposition testimony and expert report: commercial success covering a patent directed to treatment of spasticity.
- **Medeva Pharma Suisse A.G. and Proctor & Gamble Pharmaceuticals, Inc. v. Roxane Laboratories, Inc.**  
*United States District Court, District of New Jersey (Case No. 3:07-CV-05165-FLW-TJB)*  
Deposition testimony and expert report: commercial success involving a patent directed to treatment of ulcerative colitis.
- **Otsuka Pharmaceutical Co, Ltd., Inc., et al. v. Sandoz, Inc., et al.**  
*United States District Court, District of New Jersey (Case No. 07-cv-01000)*  
Trial and deposition testimony and expert report: commercial success covering a patent directed to the active ingredient of an atypical antipsychotic drug.
- **Janssen-Ortho Inc. and Daiichi Pharmaceutical Co., Ltd v. Novopharm Ltd.**  
*Canadian Federal Court (Case No. T-2175-04)*  
Trial testimony (written) and affidavit: commercial success covering a patent directed to the active ingredient of an anti-infective drug.
- **Janssen-Ortho Inc. and Daiichi Pharmaceutical Co., Ltd v. The Minister of Health; and Apotex Inc.**  
*Federal Court of Canada (Case No. T-1508-05)*  
Deposition testimony and expert report: commercial success interest involving a patent directed to an anti-infective drug.
- **Ortho-McNeil Pharmaceutical, Inc., et al. v. Mylan Laboratories**  
*United States District Court, Northern District of West Virginia (Case No. 1:02CV32)*  
Trial and deposition testimony and expert report: commercial success covering a patent directed to the active ingredient of an anti-infective drug.
- **Elan Corp., PLC v. Andrx Pharmaceuticals, Inc.**  
*United States District Court, Southern District of Florida (Case No. 98-7164)*  
Trial and deposition testimony and expert report: commercial success covering a patent directed to controlled release dosing of a nonsteroid anti-inflammatory drug.



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**Patent Cases – Other**

- **Fresenius Kabi USA, LLC v. Fera Pharmaceuticals, LLC and Oakwood Laboratories, LLC**  
*United States District Court, District of New Jersey (Case No. 15-03654-KM-MAH)*  
Deposition testimony and expert declarations: antitrust liability and damages; commercial success and preliminary injunctive relief involving patents directed to injectable drug treatment of myxedema coma.
- **Travelers Express Co. Inc. v. The Standard Register Co.**  
*United States District Court, District of Minnesota (Case No. 4-93-436)*  
Deposition testimony and expert report: lost profits, reasonable royalty, patent misuse and prejudgment interest involving patents directed to money order dispensers.

**Trade Secret Cases**

- **Steves and Sons, Inc. v. JELD-WEN, Inc.**  
*United States District Court, Eastern District of Virginia, Richmond Division (Case No. 16-cv-00545-REP)*  
Trial and deposition testimony and expert report: damages, profits, and reasonable royalty associated with alleged misappropriation of trade secrets and tortious interference with employment contracts and severance agreements involving the production of molded door skins.
- **Luminara Worldwide, LLC v. Shenzhen Liown Electronics Co., Ltd, Central Garden and Pet Co., et al.; Shenzhen Liown Electronics Co., Ltd, Central Garden and Pet Co. v. Luminara Worldwide, LLC, et al. ; and Luminara Worldwide, LLC v. Shenzhen Liown Electronics Co., Ltd and Central Garden and Pet Co., et al.**  
*United States District Court, District of Minnesota (Case Nos. 14-cv-03103 (SRN/FLN) and 15-cv-03028 (SRN/FLN))*  
Deposition testimony and expert reports: damages associated with alleged patent infringement and breach of contract, and unjust enrichment associated with breach of non-disclosure agreement and use of trade secrets, related to flameless candle technology and distribution.
- **Red Online Marketing Group LP, d/b/a 50onRED v. Revizer Ltd., d/b/a Ad Force Technologies, Ltd., and Revizer Technologies, Ltd.**  
*United States District Court, Eastern District of Pennsylvania (Case No. 14-1353)*  
Deposition testimony and expert report: damages associated with alleged misappropriation of trade secrets, breach of contract, and unfair competition (Lanham Act violations) involving internet monetization products.
- **Thomas C. Sisoian v. International Business Machines Corporation (IBM)**  
*United States District Court, Western District of Texas, Austin Division (Case No. A-14-CA-565-SS)*  
Deposition testimony and expert report: unjust revenues and profits involving misappropriation of trade secrets over developing, implementing, and integrating complex telecommunication information systems.

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- **In the Matter of Certain Sulfentrazone, Sulfentrazone Compositions, and Processes for Making Sulfentrazone (FMC (Complainant))**  
*United States International Trade Commission (Investigation No. 337-TA-914)*  
Trial and deposition testimony and expert report: irreparable harm, balance of hardships, and public interest involving a patent directed to a crop herbicide.
- **In the Matter of Certain Opaque Polymers (Organik Kimya (Respondent))**  
*United States International Trade Commission (Investigation No.337-TA-883)*  
Deposition testimony and expert report: injury, independent economic valuation, and bond involving trade secrets used in the production of opaque polymers.
- **MacDermid, Inc. v. Cookson Group, plc, Cookson Electronics, Enthone, Inc., and David North**  
*United States Superior Court, Judicial District of Waterbury (Case No.x10-cv-09-5014518-d)*  
Deposition testimony and expert report: royalty and prejudgment interest involving the misappropriation of trade secrets directed to chemicals, materials, and technical services used in a possible corporate acquisition.
- **JDS Therapeutics, LLC and Nutrition 21, LLC v. Pfizer Inc., Wyeth LLC, Wyeth Consumer Healthcare Ltd., and Wyeth Consumer Healthcare LLC**  
*United States District Court, Southern District of New York (Case No.1:12-cv-09002-JSR)*  
Deposition testimony and expert report: commercial success, reasonable royalty, and unjust enrichment involving patents and trade secrets directed to the use of chromium picolinate in multi-vitamins.
- **E. I. du Pont de Nemours and Company v. Kolon Industries, Inc. and Kolon USA, Inc.**  
*United States District Court, Eastern District of Virginia, Richmond Division (Case No. 3:09CV58)*  
Trial and deposition testimony and expert report: unjust enrichment involving misappropriation of trade secrets directed to aramid fiber production.
- **CA, Inc.; Computer Associates Think, Inc.; Platinum Technology International. Inc.; and Platinum Technology IP, Inc., v. Rocket Software, Inc.**  
*United States District Court, Eastern District of New York (Case No. 07-CV-1476 (ADS)(MLO)*  
Deposition testimony and expert report: lost profits, unjust enrichment, price erosion and prejudgment interest involving copyrights and trade secrets related to DB2 software tools.
- **Sensormatic Electronics Corp. v. The TAG Co. US LLC; Phenix Label Co.; Dennis Gadonniex**  
*United States District Court, Southern District of Florida (Case No.06-81105-Civ-Hurley/Hopkins)*  
Trial and deposition testimony and expert report: unjust enrichment involving misappropriation of trade secrets directed to loss prevention systems.
- **Cogent Systems, Inc. v. Northrop Grumman Corp.**  
*California Superior Court, County of Los Angeles, Central District (Case No.BC332199)*  
Deposition testimony and expert report: reasonable royalty involving misappropriation of trade secrets directed to fingerprint identification technology.
- **Geomatrix, LLC and David A. Potts v. Infiltration Systems, Inc.**  
*Connecticut Superior Court, District of Middlesex at Middleton (Case No.MMX-CV-05-4004477 S)*  
Deposition testimony and expert disclosure: reasonable royalty involving misappropriation of trade secrets directed to leach field and septic tank technology.

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- **McMahon Marketing v. Toyota Motor Sales**  
*California Superior Court, County of Los Angeles (Case No. BC317277)*  
Deposition testimony: damages and profits associated with trade secrets directed to a luxury hotel and automotive partnership.
- **Christopher Karol and Karol Designs, LLC v. Burton Corp.**  
*United States District Court, District of Vermont (Case No. 1:01-CV-178)*  
Deposition testimony and expert report: reasonable royalty and disgorgement of profits involving trade secrets and an NDA directed to snowboard boot and binding technology.
- **Takata Corp. v. AlliedSignal, Inc. and Breed Technologies, Inc.**  
*United States District Court, District of Delaware (Case No. 98-94-MMS)*  
Deposition testimony and expert report: reasonable royalty and prejudgment interest covering patents and trade secrets directed to seatbelt retractors.
- **Trimless-Flashless Design, Inc. v. Augat, Inc.; Thomas & Betts Corp.; and Tyco International, Ltd.**  
*United States District Court, Eastern District of Virginia (Case No. CA00-245-A)*  
Trial and deposition testimony and expert report: damages and profits associated with alleged breach of contract and misappropriation of trade secrets involving metallized particle interconnects used to connect microprocessors with mother boards.
- **Insight Development Corp. v. Hewlett-Packard Co.**  
*United States District Court, Northern District of California (Case No. C 98 3349 CW)*  
Deposition testimony and expert report: damages and profits associated with alleged contract breaches, patent, copyright and trade secret misappropriation/infringement and unfair competition involving digital image processing and transmission, including that over the internet.
- **DSC Communications Corp. v. DGI Technologies, Inc.**  
*United States District Court, Northern District of Texas (Case No. 3:94-CV-1047)*  
Trial testimony and expert report: reasonable royalty involving copyrights, trade secrets and unfair competition over telecommunications switching equipment.
- **Wayne State University; Lumigen Inc.; and A. Paul Schapp v. Irena Bronstein and Tropix Inc.**  
*State of Michigan Circuit Court, County of Wayne and Court of Claims (Case No. 88-804-627 CK/Case No. 88-11871CM)*  
Deposition testimony and expert report: unjust enrichment and lost profits involving trade secrets directed to chemiluminescence (medical detection) technology.

**Trademark Cases**

- **Katherine Dines v. Toys “R” Us-Delaware, Inc.**  
*United States District Court, District of Colorado (Case No. 12-cv-2279-PAB-KMT)*  
Deposition testimony and expert report: profits and prejudgment interest associated with trademark infringement involving a line of stuffed animal toys.
- **The Coryn Group II, LLC v. O.C. Seacrets, Inc.**  
*United States District Court, District of Maryland, Northern Division (Case No. 08-cv-02764-WDQ)*  
Trial testimony and expert report: profits and damages involving the use of “Secrets” trademark in the leisure resort business.

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- **YSL Beauté v. Oscar de la Renta, Ltd.**  
*American Arbitration Association (Case No. 13 133 01389 08)*  
Arbitration hearing testimony and expert report: damages associated with alleged breach of contract and trademark infringement involving cosmetics, fragrances and beauty products.
- **Fishman Transducers, Inc. v. Stephen Paul d/b/a “Esteban” Daystar Productions and HSN Interactive LLC**  
*United States District Court, District of Massachusetts (Case No. 07-CA-10071 RCL)*  
Trial and deposition testimony and expert report: damages and profits associated with a trademark directed to guitar transducers.
- **ISP.NET, LLC d/b/a IQuest Internet v. Qwest Communications International, Inc.**  
*United States District Court, Southern District of Indiana, Indianapolis Division (Case No. IP01-0480 C B/S)*  
Deposition testimony and expert report: reasonable royalty, disgorgement of profits and prejudgment interest involving a trademark directed to internet service provision.
- **Fuel Clothing Co., Inc. v. Safari Shirt Co. d/b/a Fuel Clothing Co., Inc.**  
*United States District Court, Western District of Washington at Tacoma (Case No. CO5 5366 KJB)*  
Deposition testimony and expert report: economic harm involving a trademark directed to sports apparel logos.
- **Alpha International, Inc. v. General Foam Plastics Corp.**  
*United States District Court, Eastern District of North Carolina (Case No. 4:01-CV-142-H(3))*  
Deposition testimony and expert report: copyright infringement, trademark infringement, conversion and unjust enrichment involving bowling pin sets and ride-on toys.
- **Fuel TV, Inc. v. Fuel Clothing Co., Inc.**  
*United States District Court, Central District of California, Western Division (Case No. CV03-8248-ABC-VBKx)*  
Deposition testimony and expert report: economic harm involving infringement of trademark used in extreme sports applications.
- **AutoNation, Inc. v. Acme Commercial Corp., et al. (CarMax)**  
*United States District Court, Southern District of Florida (Case No. 96-6141)*  
Trial and deposition testimony and expert report: reasonable royalty associated with trademark infringement and unfair competition in the auto superstore business.

**Copyright Cases**

- **Syngenta Crop Protection, LLC v. Willowood, LLC, Willowood USA, LLC, Willowood Azoxystrobin, LLC, and Willowood Limited**  
*US District Court, Middle District of North Carolina (Case No. 1:15-cv-274)*  
Trial and deposition testimony and expert report: damages and prejudgment interest related to alleged patent and copyright infringement involving crop fungicide.

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- **American Society for Testing and Materials d/b/a ASTM International; National Fire Protection Association, Inc.; and American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. v. Public.Resource.org, Inc.**  
*United States District Court for the District of Columbia (Case No. 13-cv-01215-TSC)*  
Deposition testimony and expert report: harm and public interest involving copyrights and trademarks covering standards incorporated by reference into law.
- **Complex Systems, Inc. v. ABN AMRO Bank N.V.**  
*United States District Court, Southern District of New York (Case No. 08-cv-7497)*  
Deposition testimony and expert report: revenues and profits involving copyrighted trade finance software.
- **Shepard Fairey and Obey Giant Art, Inc. v. The Associated Press v. Shepard Fairey; Obey Giant Art, Inc.; Obey Giant LLC; Studio Number One, Inc.; and One 3 Two, Inc.**  
*United States District Court, Southern District of New York (Case No. 09-01123(AKH))*  
Deposition testimony and expert report: fair use, damages and profits involving copyrighted photograph of President Obama.
- **CA, Inc.; Computer Associates Think, Inc.; Platinum Technology International, Inc.; and Platinum Technology IP, Inc., v. Rocket Software, Inc.**  
*United States District Court, Eastern District of New York (Case No. 07-CV-1476 (ADS)(MLO))*  
Deposition testimony and expert report: lost profits, unjust enrichment, price erosion and prejudgment interest involving copyrights and trade secrets related to DB2 software tools.
- **Alpha International, Inc. v. General Foam Plastics Corp.**  
*United States District Court, Eastern District of North Carolina (Case No. 4:01-CV-142-H(3))*  
Deposition testimony and expert report: copyright infringement, trademark infringement, conversion and unjust enrichment involving bowling pin sets and ride-on toys.
- **Insight Development Corp. v. Hewlett-Packard Co.**  
*United States District Court, Northern District of California (Case No. C 98 3349 CW)*  
Deposition testimony and expert report: damages and profits associated with alleged contract breaches, patent, copyright and trade secret misappropriation/infringement and unfair competition involving digital image processing and transmission, including that over the internet.
- **First National Bank of Omaha v. Three Dimensions Systems Products, Inc.**  
*United States District Court, District of Nebraska (Case No. 8:98CV569)*  
Trial and deposition testimony and expert report: damages and profits associated with an alleged contract breach and copyright infringement involving financial services software.
- **Leslie Atkins v. Benson J. Fischer, et al.**  
*United States District Court, District of Columbia (Case No. 1:98CV00800)*  
Deposition testimony and expert report: damages and profits associated with copyright infringement covering beer label and packaging designs.
- **Wrench LLC v. Taco Bell Corp.**  
*United States District Court, Southern District of Michigan (Case No. 1:98-CV-45)*  
Trial and deposition testimony and expert report: unjust enrichment and actual damages involving chihuahua promotional campaign.

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- **DSC Communications Corp. v. DGI Technologies, Inc.**  
*United States District Court, Northern District of Texas (Case No. 3:94-CV-1047)*  
Trial testimony and expert report: reasonable royalty involving copyrights, trade secrets and unfair competition over telecommunications switching equipment.

**Breach of Contract Cases**

- **Western Enterprises, Inc. v. Buckeye Rubber & Packaging Co.; Freudenberg-NOK General Partnership, a/k/a Freudenberg-NOK Sealing Technologies, Inc.; and International Seal Company, Inc.** *Court of Common Pleas, Cuyahoga County, Ohio (Case No. 16-869179)*  
Deposition testimony and expert report: damages associated with alleged breaches of contract, duty to indemnify, and negligence related to portable oxygen systems.
- **Luminara Worldwide, LLC v. Shenzhen Liown Electronics Co., Ltd, Central Garden and Pet Co., et al.; Shenzhen Liown Electronics Co., Ltd, Central Garden and Pet Co. v. Luminara Worldwide, LLC, et al. ; and Luminara Worldwide, LLC v. Shenzhen Liown Electronics Co., Ltd and Central Garden and Pet Co., et al.**  
*United States District Court, District of Minnesota (Case Nos. 14-cv-03103 (SRN/FLN) and 15-cv-03028 (SRN/FLN))*  
Deposition testimony and expert reports: damages associated with alleged patent infringement and breach of contract, and unjust enrichment associated with breach of non-disclosure agreement and use of trade secrets, related to flameless candle technology and distribution.
- **Red Online Marketing Group LP, d/b/a 50onRED v. Revizer Ltd., d/b/a Ad Force Technologies, Ltd., and Revizer Technologies, Ltd.**  
*United States District Court, Eastern District of Pennsylvania (Case No. 14-1353)*  
Deposition testimony and expert report: damages associated with alleged misappropriation of trade secrets, breach of contract, and unfair competition (Lanham Act violations) involving internet monetization products.
- **Luminara Worldwide, LLC v. Shenzhen Liown Electronics Co., Ltd.**  
*State of Minnesota District Court, County of Hennepin Fourth Judicial District (Case No. 27-CV-14-16085)*  
Deposition testimony and expert report: damages associated with alleged breaches of contract and duty of good faith and fair dealing related to agreements to manufacture flameless candles.
- **ABS Holdings, Ltd. and ABS Global, Ltd. v. KT Corporation and KTSAT Corporation**  
*International Court of Arbitration of the International Chamber of Commerce*  
Arbitration hearing testimony and expert declaration: damages associated with alleged breaches of contract involving the sale and on-going operations of a satellite.
- **Bayer CropScience AG and Bayer CropScience NV v. Dow AgroSciences LLC, Mycogen Plant Science Inc., Agrigenetics, Inc. d/b/a Mycogen Seeds LLC, and Phytogen Seed Company, LLC**  
*International Chamber of Commerce (Case No. 18892/VRO /AGF)*  
Arbitration hearing testimony and expert report: damages associated with alleged breach of contract and patent infringement involving genetically modified seed.



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- **Immunomedics Inc. v. Nycomed GmnH (n/k/a Takeda GmbH), Takeda Pharmaceutical Company Limited, and Takeda Pharmaceuticals International, Inc.**  
*International Center for Dispute Resolution*  
Arbitration hearing testimony and expert report: diminution of value associated with the delayed/failed development of a monoclonal antibody drug to treat various autoimmune diseases.
- **Avocent Redmond Corp. v. Raritan Americas, Inc.**  
*United States District Court, Southern District of New York (Case No. 10-cv-6100 (PKC)(JLC))*  
Deposition testimony and expert report: lost profits, lost royalties, reasonable royalty and prejudgment interest involving a patent and contract directed to software and hardware products and technologies that provide connectivity and centralized management of IT infrastructure through KVM switches.
- **General Assurance of America, Inc. v. Overby-Seawell Company**  
*United States District Court, Eastern District of Virginia, Alexandria Division (Case No. 1:11CV483)*  
Deposition testimony and expert report: damages and profits associated with obligations arising from a contract involving specialized insurance products.
- **Frontline Placement Technologies, Inc. v. CRS, Inc.**  
*United States District Court, Eastern District of Pennsylvania (Case No. 2:07-CV-2457)*  
Deposition testimony and expert report: lost profits, lost royalties, reasonable royalty and prejudgment interest involving a patent and contract directed to automated substitute fulfillment software.
- **Amkor Technology, Inc. v. Tessera, Inc.**  
*International Chamber of Commerce, International Court of Arbitration (Case No.166531/VRO)*  
Arbitration hearing and deposition testimony and expert report: royalty payments due under a contract directed to semiconductor packaging technology.
- **Max-Planck-Gesellschaft zur Förderung der Wissenschaften E. V.; Max-Planck-Innovation GmbH; and Alnylam Pharmaceuticals, Inc. v. Whitehead Institute for Biomedical Research; Massachusetts Institute of Technology; and the Board of Trustees of the University of Massachusetts**  
*United States District Court, District of Massachusetts (Case No. 2009-11116-PBS)*  
Deposition testimony and expert report: damages and profits associated with contracts covering the transfer and sharing of RNAi technology.
- **YSL Beauté v. Oscar de la Renta, Ltd.**  
*American Arbitration Association (Case No. 13 133 01389 08)*  
Arbitration hearing testimony and expert report: damages associated with alleged breach of contract and trademark infringement involving cosmetics, fragrances and beauty products.
- **IMTEC Imaging LLC v. CyberMed, Inc.**  
*JAMS Arbitration (Reference No.1410005418)*  
Arbitration hearing and deposition testimony and expert report: lost profits and development costs associated with the alleged breach of a contract involving a software license agreement directed to cone beam computed tomography machines used in dental applications.

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- **Biosynexus, Inc. v. Glaxo Group Limited and MedImmune, Inc.**  
*New York Supreme Court, County of New York (Case No. 604485/05)*  
Deposition testimony and expert report: diminution of value associated with the delayed/failed development of a pediatric anti-infective drug.
- **Indiana Mills & Manufacturing, Inc. v. Dorel Industries, Inc.**  
*United States District Court, Southern District of Indiana (Case No. 1:04-CV-1102)*  
Deposition testimony and expert report: damages and profits associated with alleged contract breach and patent infringement involving technology directed to automobile child restraint systems.
- **ETEX Corp. v. Medtronic, Inc.; Medtronic International Limited; and Medtronic Sofamor Danek, Inc.**  
*CPR Institute for Dispute Resolution*  
Arbitration hearing and deposition testimony and expert report: lost revenues and profits associated with alleged contractual breaches and antitrust violations involving spinal implant materials.
- **Audiotext International, Ltd. and New Media Group, Inc. v. Sprint Communications Co., L.P.**  
*United States District Court, Eastern District of Pennsylvania (Case No.03-CV-2110)*  
Deposition testimony and expert report: non-delivery damages involving contracts covering resale of telecommunications services.
- **Medtronic Sofamor Danek, Inc. v. Gary K. Michelson, M.D. and Karlin Technology, Inc.**  
*United States District Court, Western District of Tennessee (Case No. 01-2373 GV)*  
Trial and deposition testimony and expert report: damages and profits associated with alleged contractual breaches, tortious interference and intentional negligent representations involving spinal implants.
- **Honeywell International, Inc. and GEM Microelectronic Materials LLC v. Air Products and Chemicals, Inc. and Ashland, Inc.**  
*Delaware Chancery Court, County of New Castle (Case No.20434-NC)*  
Trial and deposition testimony and expert report: lost profits associated with alleged contractual breach and tortious interference as well as irreparable harm inquiry involving a strategic alliance to provide electronic chemicals, gases and services to the semiconductor industry.
- **Christopher Karol; and Karol Designs, LLC v. Burton Corp.**  
*United States District Court, District of Vermont (Case No. 1:01-CV-178)*  
Deposition testimony and expert report: reasonable royalty and disgorgement of profits involving trade secrets and an NDA directed to snowboard boot and binding technology.
- **Interactive Return Service, Inc. v. Virginia Polytechnic Institute and State University, et al.**  
*Circuit Court for the City of Richmond (Case No.LM-870-3)*  
Deposition testimony: lost profits and lost licensing fees involving contracts to develop interactive/return path communications.
- **City of Hope National Medical Center v. Genentech, Inc.**  
*Superior Court, State of California, County of Los Angeles (Case No. BC215152)*  
Deposition testimony and expert report: damages associated with alleged breach of contract involving license fees for use of recombinant DNA technology.



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- **Igen International, Inc. v. Roche Diagnostics GmbH**  
*United States District Court, Southern Division of Maryland (Case No. PJM 97-3461)*  
Trial and deposition testimony and expert report: damages and profits associated with an alleged breach of contract involving electrochemiluminescent detection technology used in DNA probe and immunoassay kits.
- **Trimless-Flashless Design, Inc. v. Augat, Inc.; Thomas & Betts Corp.; Tyco International, Ltd.**  
*United States District Court, Eastern District of Virginia (Case No. CA00-245-A)*  
Trial and deposition testimony and expert report: damages and profits associated with alleged breach of contract and misappropriation of trade secrets involving metallized particle interconnects used to connect microprocessors with mother boards.
- **New Industries Co. (Sudan) Ltd. v. PepsiCo, Inc.**  
*American Arbitration Association (Case No. 50 T 114 00001 95)*  
Arbitration hearing testimony and expert report: damages and profits associated with breaches of PepsiCo franchise agreement.
- **Insight Development Corp. v. Hewlett-Packard Co.**  
*United States District Court, Northern District of California (Case No. C 98 3349 CW)*  
Deposition testimony and expert report: damages and profits associated with alleged contract breaches, patent, copyright and trade secret misappropriation/infringement and unfair competition involving digital image processing and transmission, including that over the internet.
- **First National Bank of Omaha v. Three Dimensions Systems Products, Inc.**  
*United States District Court, District of Nebraska (Case No. 8:98CV569)*  
Trial and deposition testimony and expert report: damages and profits associated with an alleged contract breach and copyright infringement involving financial services software.
- **Computer Aid v. Hewlett-Packard**  
*United States District Court, Eastern District of Pennsylvania (Case No. (C-96-3085 (MHP))*  
Deposition testimony and expert report: appropriate discount rate and prejudgment interest rate involving a failed software development contract.
- **Wrench LLC v. Taco Bell Corp.**  
*United States District Court, Southern District of Michigan (Case No. 1:98-CV-45)*  
Trial and deposition testimony and expert report: unjust enrichment and actual damages involving chihuahua promotional campaign.
- **Kabushiki Kaisha Izumi Seiko Seiskusho v. Windmere Corp. et al.**  
*United States District Court, Southern District of Florida (Case No, 94-0803-CIV-MOORE)*  
Deposition testimony and expert declaration: lost revenues and lost profits in a breach of contract, fraud and antitrust case involving rotary shavers.

**Antitrust Cases**

- **Rambus Inc., v. Micron Technology, Inc.**  
*California Superior Court, County of San Francisco (Case No. 04-431105)*  
Deposition testimony and expert report: lost revenues and profits associated with alleged antitrust violations related to DRAM technology.

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- **ETEX Corp. v. Medtronic, Inc.; Medtronic International Limited; and Medtronic Sofamor Danek, Inc.**  
*CPR Institute for Dispute Resolution*  
Arbitration hearing and deposition testimony and expert report: lost revenues and profits associated with alleged contractual breaches and antitrust violations involving spinal implant materials.
- **Kabushiki Kaisha Izumi Seiko Seiskusho v. Windmere Corp. et al.**  
*United States District Court, Southern District of Florida (Case No. 94-0803-CIV-MOORE)*  
Deposition testimony and expert declaration: lost revenues and lost profits in a breach of contract, fraud and antitrust case involving rotary shavers.
- **DSC Communications Corp. v. DGI Technologies, Inc.**  
*United States District Court, Northern District of Texas (Case No. 3:94-CV-1047)*  
Trial testimony and expert report: reasonable royalty involving copyrights, trade secrets and unfair competition over telecommunications switching equipment.
- **Travelers Express Co. Inc. v. The Standard Register Co.**  
*United States District Court, District of Minnesota (Case No. 4-93-436)*  
Deposition testimony and expert report: lost profits, reasonable royalty, patent misuse and prejudgment interest involving patents directed to money order dispensers.

**General Tort Cases**

- **Western Enterprises, Inc. v. Buckeye Rubber & Packaging Co.; Freudenberg-NOK General Partnership, a/k/a Freudenberg-NOK Sealing Technologies, Inc.; and International Seal Company, Inc.** *Court of Common Pleas, Cuyahoga County, Ohio (Case No. 16-869179)*  
Deposition testimony and expert report: damages associated with alleged breaches of contract, duty to indemnify, and negligence related to portable oxygen systems.
- **General Assurance of America, Inc. v. Overby-Seawell Company**  
*United States District Court, Eastern District of Virginia, Alexandria Division (Case No. 1:11CV483)*  
Deposition testimony and expert report: damages and profits associated with obligations arising from a contract involving specialized insurance products.
- **The Osage Tribe of Indians of Oklahoma v. The United States of America**  
*United States Court of Federal Claims (Case No. 99-550 L (into which is consolidated No. 00-169L))*  
Deposition testimony and expert declaration: present value interest from unpaid oil royalties.
- **Biosynexus, Inc. v. Glaxo Group Limited; and MedImmune, Inc.**  
*New York Supreme Court, County of New York (Case No. 604485/05)*  
Deposition testimony and expert report: diminution of value associated with the delayed/failed development of a pediatric anti-infective drug.
- **Bavarian Nordic A/S and Anton Mayr v. Acambis, Inc.**  
*United States District Court, District of Delaware (Case No. 05-614-SLR)*  
Deposition testimony and expert report: unjust enrichment and value of property associated with tortious conversion, unfair trade practices and unfair competition involving proprietary technology directed to vaccines.

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- **Alpha International, Inc. v. General Foam Plastics Corp.**  
*United States District Court, Eastern District of North Carolina (Case No. 4:01-CV-142-H(3))*  
Deposition testimony and expert report: copyright infringement, trademark infringement, conversion and unjust enrichment involving bowling pin sets and ride-on toys.
- **Medtronic Sofamor Danek, Inc. v. Gary K. Michelson, M.D. and Karlin Technology, Inc.**  
*United States District Court, Western District of Tennessee (Case No. 01-2373 GV)*  
Trial and deposition testimony and expert report: damages and profits associated with alleged contractual breaches, tortious interference and intentional negligent representations involving spinal implants.
- **Honeywell International, Inc. and GEM Microelectronic Materials LLC v. Air Products and Chemicals, Inc. and Ashland, Inc.**  
*Delaware Chancery Court, County of New Castle (Case No.20434-NC)*  
Trial and deposition testimony and expert report: lost profits associated with alleged contractual breach and tortious interference as well as irreparable harm inquiry involving a strategic alliance to provide electronic chemicals, gases and services to the semiconductor industry.
- **Interactive Return Service, Inc. v. Virginia Polytechnic Institute and State University, et al.**  
*Circuit Court for the City of Richmond (Case No.LM-870-3)*  
Deposition testimony: lost profits and lost licensing fees involving contracts to develop interactive/return path communications.
- **Omega Engineering, Inc. v. Cole-Parmer Instrument Co.; Davis Instrument Manufacturing Co., Inc.; Dwyer Instruments, Inc.; and Raytek Corp.**  
*United States District Court, District of Connecticut (Case Nos.3:98 CV 00733 (JCH), 3:98 CV 02052 (JCH) and 3:98 CV 02276 (JCH))*  
Trial and deposition testimony and expert report: lost profits, reasonable royalty and prejudgment interest involving patents and alleged unfair competitive practices directed to portable infrared thermometers.
- **The University of Colorado Foundation Inc., et al. v. American Cyanamid Co.**  
*United States District Court, District of Colorado (Case No.93-K-1657)*  
Trial and deposition testimony and expert report: measure and amount of prejudgment interest in a patent infringement, fraud and unjust enrichment case covering prenatal vitamin formulations.
- **Hunter Group, Incorporated v. Susan Smith, et al.**  
*United States District Court, District of Maryland (Case No. 97-2218)*  
Trial and deposition testimony and expert report: lost enterprise value and lost profits associated with improper solicitation of enterprise resource planning software trainers.
- **William Aramony v. United Way of America et al.**  
*United States District Court, Southern District of New York (Case No. 96 Civ. 3962 (SAS))*  
Trial testimony and expert report: lost contributions and out-of-pocket losses surrounding the departure of United Way of America president.
- **Fox v. Fox**  
*State of Virginia, Circuit Court, Arlington County (Chancery No. 96-80)*  
Trial testimony (proffered) and expert report: prospective valuation of a patent portfolio involving lasers used for lithotripsy and angioplasty.

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- **AutoNation, Inc. v. Acme Commercial Corp., et al. (CarMax)**  
*United States District Court, Southern District of Florida (Case No. 96-6141)*  
Trial and deposition testimony and expert report: reasonable royalty associated with trademark infringement and unfair competition in the auto superstore business.

**International Trade Cases**

- **In the Matter of Certain Magnetic Data Storage Tapes and Cartridges Containing the Same (II) (Sony Corporation, Sony Storage Media Solutions Corporation, Sony Storage Media Manufacturing Corporation, Sony DADC US, Inc., and Sony Latin America (Respondents))**  
*United States International Trade Commission (Inv. No. 337-TA-1076)*  
Trial and deposition testimony and expert report: public interest issues involving patents directed to certain magnetic data storage tapes and cartridges.
- **In the Matter of Certain Magnetic Data Storage Tapes and Cartridges Containing the Same (Sony Corporation, Sony Corporation of America, and Sony Electronics, Inc. (Respondents))**  
*United States International Trade Commission (Inv. No. 337-TA-1012)*  
Trial and deposition testimony and expert report: economic evaluation of FRAND, commercial success, bond, remedy, domestic industry, and public interest issues involving patents directed to certain magnetic data storage tapes and cartridges.
- **In the Matter of Certain 3G Mobile Handsets and Components Thereof (Nokia (Respondent))**  
*United States International Trade Commission (Inv. No. 337-TA-613)*  
Trial and deposition testimony and expert report: economic evaluation of whether proposed license terms for certain wireless devices are discriminatory under a FRAND obligation and economic evaluation of hold-up and reverse hold-up.
- **In the Matter of Certain Sulfentrazone, Sulfentrazone Compositions, and Processes for Making Sulfentrazone (FMC (Complainant))**  
*United States International Trade Commission (Investigation No. 337-TA-914)*  
Trial and deposition testimony and expert report: irreparable harm, balance of hardships, and public interest involving a patent directed to a crop herbicide.
- **In the Matter of Certain Opaque Polymers (Organik Kimya (Respondent))**  
*United States International Trade Commission (Investigation No. 337-TA-883)*  
Deposition testimony and expert report: injury, independent economic valuation, and bond involving trade secrets used in the production of opaque polymers.
- **In the Matter of Certain Wireless Devices with 3G and/or 4G Capabilities and Components Thereof (Nokia (Respondent))**  
*United States International Trade Commission (Investigation No. 337-TA-868)*  
Trial and deposition testimony and expert report: economic evaluation of whether proposed license terms for certain wireless devices are discriminatory under a FRAND obligation, and economic evaluation of hold-up and reverse hold-up.
- **In the Matter of Certain Wireless Devices with 3G Capabilities and Components Thereof (Nokia (Respondent))**  
*United States International Trade Commission (Investigation No. 337-TA-800)*  
Trial and deposition testimony and expert report: economic evaluation of whether proposed license terms for certain wireless devices are discriminatory under a FRAND obligation.

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- **In the Matter of Certain Computing Devices with Associated Instruction Sets and Software (VIA Technologies, Inc., Centaur Technology, IP-First LLC (Complainants))**  
*United States International Trade Commission (Investigation No. 337-TA-812)*  
Trial and deposition testimony and expert report: economic evaluation of domestic industry issues associated with importation of certain computing devices.
- **In the Matter of Certain Modified Vaccinia Ankara ("MVA") Viruses and Vaccines and Pharmaceutical Compositions Based Thereon (Bavarian Nordic A/S (Complainant))**  
*United States International Trade Commission (Investigation No. 337-TA-550)*  
Deposition testimony and expert report: domestic industry and injury involving patents and proprietary technology directed to vaccines.

**Malpractice Cases**

- **TattleTale Portable Alarm Systems, Inc. v. Calfee, Halter & Griswold LLP, et al.**  
*United States District Court, Southern District of Ohio, Eastern Division (Case No. 2:10-CV-226)*  
Deposition testimony and expert report: lost royalties associated with a law firm's negligence in handling a patent directed to portable alarm systems.
- **Timothy Robinson and Whorl, LLC v. Cohen Mohr, LLP; Dan Duval; Perkins Coie, LLP; Perkins Coie, L.P.C.; Perkins Coie, D.C.P.C.; and Perkins Coie, California, P.C.**  
*State of Virginia, Circuit Court of Fairfax County (Case No. CL-2009-080)*  
Deposition testimony and expert report: lost value and prejudgment interest involving allegations of law firm's negligence in securing an interest in intellectual property directed to biometric payment technology.
- **Frank Robertson and Cayvon, Inc. v. Nexsen Pruet Jacobs & Pollard, LLP**  
*South Carolina Common Pleas Court, Fifth Judicial Circuit, Richland (Case No. 2004-CP-40-5531)*  
Deposition testimony: lost profits associated with a law firm's negligence in handling a patent directed to commercial nut-cracking machines.
- **Anodyne Corp. v. Klaas, Law, O'Meara & Malkin**  
*State of Colorado District Court, City and County of Denver (Case No. 97-CV-7129)*  
Trial testimony and expert report: lost licensing income and prejudgment interest associated with a law firm's negligence in filing a patent application directed to wrappable flashlights.

**FRAND Cases**

- **Audio MPEG, Inc., U.S. Philips Corporation, TDF SAS, and Institut Für Rundfunktechnik GmbH v. Dell, Inc.**  
*United States District Court, Eastern District of Virginia, Norfolk Division (Case No. 1:15-CV-1674 AJT/TCB)*  
Deposition testimony and expert report: analysis of patent pool compliance with FRAND commitments and determination of FRAND-compliant royalties involving patents directed to the transmission and storage of digital audio files.

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**TAB 1**

- **In the Matter of Certain Magnetic Data Storage Tapes and Cartridges Containing the Same (Sony Corporation, Sony Corporation of America, and Sony Electronics, Inc. (Respondents))**  
*United States International Trade Commission (Inv. No. 337-TA-1012)*  
Trial and deposition testimony and expert report: economic evaluation of FRAND, commercial success, bond, remedy, domestic industry, and public interest issues involving patents directed to certain magnetic data storage tapes and cartridges.
- **In the Matter of Certain 3G Mobile Handsets and Components Thereof (Nokia (Respondent))**  
*United States International Trade Commission (Inv. No. 337-TA-613)*  
Trial and deposition testimony and expert report: economic evaluation of whether proposed license terms for certain wireless devices are discriminatory under a FRAND obligation and economic evaluation of hold-up and reverse hold-up.
- **In the Matter of Certain Wireless Devices with 3G and/or 4G Capabilities and Components Thereof (Nokia (Respondent))**  
*United States International Trade Commission (Investigation No.337-TA-868)*  
Trial and deposition testimony and expert report: economic evaluation of whether proposed license terms for certain wireless devices are discriminatory under a FRAND obligation, and economic evaluation of hold-up and reverse hold-up.
- **In the Matter of Certain Wireless Devices with 3G Capabilities and Components Thereof (Nokia (Respondent))**  
*United States International Trade Commission (Investigation No.337-TA-800)*  
Trial and deposition testimony and expert report: economic evaluation of whether proposed license terms for certain wireless devices are discriminatory under a FRAND obligation.

**EDITED BOOKS**

- *Eckstrom's Licensing in Foreign and Domestic Operations: The Forms and Substance of Licensing*, (2012 – 2016).

**ARTICLES**

- “Introduction to Lost Profits” (with Robert Vigil and Michael Chapman), chapter in *Lost Profits Damages: Principles, Methods and Applications* (2017).
- “Assessing Commercial Success at the U.S. Patent Trial and Appeal Board” (with Robert L. Vigil), *International In-House Counsel Journal* (Summer 2015).
- “Response to Rejoinder: Clearing Up The Confusion” (with Michael J. Chapman), *Law360* (IP, Technology, Appellate, and California Law360) (September 3, 2015).
- “Rebuttal: It’s Not An Inappropriate Reasonable Royalty Rule” (with Michael J. Chapman), *Law360* (IP, Technology, and California Law360) (August 24, 2015).
- “Problems With Hypothesizing a Reasonable Royalty Negotiation” (with Michael J. Chapman), *Law360* (IP Law360) (January 7, 2014).



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**TAB 1**

- “The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog” (with Michael J. Chapman), *Stanford Technology Law Review* (Vol. 16 No. 3, Spring 2013).
- “The 25% Rule Lives On” (with Carla Mulhern and Michael Wagner), *Law360* (IP Law360) (September 8, 2010).
- “Patent Auctions: How Far Have We Come?” (with Robin Heider, Coleman Bazelon, Christine Bieri and Peter Hess), *les Nouvelles, Journal of The Licensing Executives Society* (March 2010) (article of the month).
- “The Economic Implications (and Uncertainties) of Obtaining Permanent Injunction Relief after eBay v. MercExchange” (with Douglas Ellis, Michael Chapman and Scott Oliver), *Federal Circuit Bar Journal* (Vol. 17 No. 4, 2008).
- “Application of Game Theory to Intellectual Property Royalty Negotiations” (with Michael J. Chapman) *Licensing Best Practices: Strategic, Territorial and Technology Issues* (2006).
- “Book Review: *The LESI Guide to Licensing Best Practices: Strategic Issues and Contemporary Realities*”, 21 *Intellectual Property Law Newsletter* 18 (Winter 2003).
- “Use of the 25 Per Cent Rule in Valuing IP” (with Robert Goldscheider and Carla S. Mulhern), 37 *les Nouvelles, Journal of The Licensing Executives Society* 123 (December 2002). Also in G. Smith and R. Parr, *Intellectual Property: Valuation, Exploitation and Infringement Damages* (2005).
- “Intellectual Property Valuation and *Hughes Aircraft v. The United States*: A Giant Leap for Mankind or Lost in Space?” (with Brett L. Reed), R. Parr, *Intellectual Property Infringement Damages: A Litigation Support Handbook, 1997 Cumulative Supplement* (1997).
- “Damages in Patent and Trademark Infringement,” *The Journal of Business Valuation* (1995).
- “The Panduit Lost Profits Test After *BIC Leisure v. Windsurfing*,” 3 *The Federal Circuit Bar Journal* 311 (Fall 1993) (with Erin M. Page). Also in 3 *Bright Ideas* - The Newsletter of the Intellectual Property Law Section of the New York State Bar Association 36 (Spring, 1994).
- “The CAFC and its Patent Damages Awards,” 1 *The University of Baltimore Intellectual Property Law Journal* 17 (1992).
- “Pre-tax Versus After-tax Patent Damages: Do the Courts Have It Right?” 74 *Journal of the Patent and Trademark Office Society* 938 (December 1992). Also in 7 *Managing Intellectual Property* 17 (March, 1993).
- “Taxes and Lost Profits,” 7 *Commercial Damages Reporter*, 177 (Iss. 6, Sept. 1992).
- “Considering Taxes in the Computation of Lost Business Profits.” 25 *Creighton L.R.* 41 (1991).

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**SPEECHES/COURSES/PRESENTATIONS**

- “Apportionment in Reasonable Royalty Cases,” Reasonable Royalty Damages, Apportionment and Expert Opinions in Light of *Exmark* Case, The Knowledge Group, May 2018 (with Matthew Lynde, Russell Mangum III, and Joel Wacek).
- “Remedies,” Guest Lecturer, Georgetown University Law Center, April 2012, April 2013, April 2014, April 2015, April 2016, April 2017, and April 2018 (with John Taurman).
- “Apportionment in Reasonable Royalty Cases,” Apportionment in Patent Damages: What you Need to Know and Do, The Knowledge Group, March 2018 (with Daniel McGavock and John Scalf).
- “Post-Trial Remedies,” What Is My Intellectual Property Worth: Issues That Make a Difference Inside and Outside the Courtroom, Inaugural IP Conference on Issues that Make A Difference, University of Arizona James E. Rogers College of Law, March 2018 (with Timothy Sendek).
- “Design Patent Damages Before Apple v. Samsung,” Design Patent Damages: Hot Buttons in 2017 and Beyond, The Knowledge Group, July 2017 (with Barry Bell and Jeffery Stec).
- “Early Consideration of Patent Damages,” The Sedona Conference Webinar, June 2017 (with Hon. John Love, Melissa Finocchio, and Andrea Weiss Jeffries).
- “Permanent Injunctive Relief,” Recent Developments in Damages and Injunctions Law, IPO Damages & Injunctions Committee Conference, June 2017 (with Sarah Burstein, Mark Halligan, David Nelson, and Jenna Pellecchia).
- “U.S. Patent Landscape,” The European Patent Market – The Next Wave for Business? International In-House Counsel Journal 5<sup>th</sup> Annual Conference, March 2017 (with Anders Arvidsson, Mark Houghton, and Bruce Girvan).
- “The Conference on Patent Damages,” University of Texas School of Law, February 2017 (with David Abrams, Elizabeth Bailey, James Kearl, Shirley Webster, and Michael Risch).
- “2016 Patent Damages Daubert Opinions,” The Evolving Landscape in the Calculation of Patent Damages – Reasonable Royalties, The Knowledge Group, February 2017 (with Barry Bell, James McGovern, and Jeffery Stec).
- “Commercial Success at the PTAB: 2016 Update,” Strafford Publications CLE Webinar, September 2016 (with Michael Flibbert and Maureen Queler).
- “Economic Perspectives on Recent Patent Damages Rulings,” Silicon Valley Intellectual Property Law Association, May 2016 (with Michael Chapman).
- “Recent Developments in Reasonable Royalty Damages,” Intellectual Property Owners Association Patent Damages Summit, May 2016 (with Charles Barquist, Douglas Melamed, Joseph Shear, and Karen Vogel Weil).



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- “The Rise of the ‘Footprint’ Approach in Reasonable Royalty Damages: What’s New in 2016,” The Knowledge Group, February 2016 (with Lisa Cameron, Thomas Dunlap, Kevin Goldman, and Michael Padden).
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**TAB 1**

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**TAB 1**

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- “Internet Patents – Monetary Remedies,” American Intellectual Property Law Association Mid-winter Meeting – IP Law in Cyberspace, February 1999 (with R. Jeffrey Malinak).
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**TAB 1**

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**TAB 2**

**DOCUMENTS REVIEWED AND/OR RELIED UPON**

<b>Bates Documents</b>		
ARC 00302	—	ARC 00306
ARC0002950	—	ARC0003222
ARC0003344	—	ARC0003450
ARC0003711	—	ARC0003752
CMU_001108	—	CMU_001334
CMU1_002468	—	CMU1_002470
LAMBETH-000150152	—	LAMBETH-000150190
LAMBETH-000150192	—	LAMBETH-000150193
LAMBETH-000150326	—	LAMBETH-000150327
LAMBETH-000213433	—	LAMBETH-000213457
LAMBETH-000215004	—	LAMBETH-000216031
LAMBETH-000217109	—	LAMBETH-000218772
LAMBETH-000222078	—	LAMBETH-000222098
LAMBETH-000224014	—	LAMBETH-000224031
LAMBETH-000224288		
LAMBETH-000227333	—	LAMBETH-000227358
LAMBETH-000230938	—	LAMBETH-000230951
LAMBETH-000231213	—	LAMBETH-000231214
LAMBETH-000231960		
LAMBETH-000231986		
LAMBETH-000232010		
LAMBETH-000235776	—	LAMBETH-000235937
LAMBETH-000244864		
LAMBETH-000244933		
LAMBETH-000244936	—	LAMBETH-000244938
LAMBETH-000254597	—	LAMBETH-000310214
LAMBETH-000310235	—	LAMBETH-000310396
LAMBETH-KL-000133	—	LAMBETH-KL-000137
LAMBETH-KL-000193	—	LAMBETH-KL-000213
MSFT_SEA000017	—	MSFT_SEA000033
MSFT_SEA000071		
SEA 00001-A		
SEA00091610	—	SEA00091647
SEA00161096	—	SEA00161152
SEA00183901	—	SEA00184261
SEA00380467	—	SEA00380517
SEA00500892	—	SEA00502213

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SEA00507193	—	SEA00507209
SEA00527049	—	SEA00527088
SEA00999215	—	SEA00999242
SEA01004497	—	SEA01004528
SEA01007381	—	SEA01007417
SEA01008261	—	SEA01008272
SEA01042992	—	SEA01043147
SEA01109636	—	SEA01109691
SEA01156200		
SEA01387720	—	SEA01388385
SEA01423163	—	SEA01423202
SEA01912299	—	SEA01912368
SEA01960011	—	SEA01960016
SEA02007789	—	SEA02007805
SEA02040170	—	SEA02040186
SEA02238164	—	SEA02238300
SEA02293156		
SEA02293974		
SEA02297245		
SEA02337801	—	SEA02339754
SEA02372262	—	SEA02372341
SEA02372422	—	SEA02372448
SEA02395215	—	SEA02395359
SEA02401016	—	SEA02401047
SEA02502018	—	SEA02502114
SEA02534719	—	SEA02534759
SEA02545926	—	SEA02545968
SEA02547439	—	SEA02547469
SEA02730734	—	SEA02730834
SEA02792174	—	SEA02792177
SEA02792302	—	SEA02792305
SEA02795817	—	SEA02795820
SEA02796360	—	SEA02796363
SEA02798442	—	SEA02798445
SEA02800608	—	SEA02800611
SEA02800967	—	SEA02800969
SEA02800986	—	SEA02800988

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SEA02801047	—	SEA02801050
SEA02801113	—	SEA02801116
SEA02801125	—	SEA02801129
SEA02843104		
SEA02851751		
SEA03106947	—	SEA03107026
SEA03148861		
SEA03336123	—	SEA03336134
SEA03336139	—	SEA03336269
SEA03336314	—	SEA03336315
SEA03336536	—	SEA03337696

Case Documents:

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**TAB 2**

**DOCUMENTS REVIEWED AND/OR RELIED UPON**

Case Documents (continued):

Seagate's Third Supplemental Objections and Answers to Lambeth Magnetic Structures, LLC's First Set of Interrogatories (No. 2), Case No. 2:16-cv-00538-CB, March 23, 2018.

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Depositions:

Deposition of Alyssa Talley, September 12, 2017, with Exhibits.  
Deposition of David N. Lambeth, February 23, 2018, with Exhibits.  
Deposition of David N. Lambeth, February 26, 2018, with Exhibits.  
Deposition of David N. Lambeth, February 27, 2018, with Exhibits.  
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Deposition of Jesse Yang, Vol. I, February 16, 2018, with Exhibits.  
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Deposition of Kevin Coffey, Ph.D., Vol. I, January 11, 2017, with Exhibits.  
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Deposition of Phillip Mitchell, December 6, 2017, with Exhibits.  
Deposition of Robert A. Wooldridge, February 15, 2018, with Exhibits.  
Deposition of Robert J. Pechman, February 8, 2018, with Exhibits.  
Deposition of Steven Fricke, September 12, 2017, with Exhibits.  
Deposition of Venkateswara Inturi, Ph.D., October 5, 2017, with Exhibits and Errata.

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**TAB 2**

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*Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.*, 575 F.2d (6th Cir. 1978).  
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*Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, No. 2016-2691, 2018 WL 3233107 F.3d (Fed. Cir. July 3, 2018).  
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**TAB 2**

**DOCUMENTS REVIEWED AND/OR RELIED UPON**

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## TAB 3

SEAGATE TECHNOLOGY PLC  
CONSOLIDATED STATEMENT OF INCOME  
FY2002 – FY2017

	FY2002		FY2003		FY2004		FY2005		FY2006		FY2007		FY2008		FY2009	
	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%
[1] Revenue	\$6,087	100 0%	\$6,486	100 0%	\$6,224	100 0%	\$7,553	100 0%	\$9,206	100 0%	\$11,360	100 0%	\$12,708	100 0%	\$9,805	100 0%
[2] HDD Revenue	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-
[3] Cost of Revenue	\$4,494	73 8%	\$4,759	73 4%	\$4,765	76 6%	\$5,880	77 8%	\$7,069	76 8%	\$9,175	80 8%	\$9,503	74 8%	\$8,395	85 6%
[4] Gross Profit	\$1,593	26 2%	\$1,727	26 6%	\$1,459	23 4%	\$1,673	22 2%	\$2,137	23 2%	\$2,185	19 2%	\$3,205	25 2%	\$1,410	14 4%
[5] Operating Expenses																
[6] Product development	\$698	11 5%	\$670	10 3%	\$666	10 7%	\$645	8 5%	\$805	8 7%	\$904	8 0%	\$1,028	8 1%	\$953	9 7%
[7] Marketing and administrative	\$498	8 2%	\$357	5 5%	\$290	4 7%	\$306	4 1%	\$447	4 9%	\$589	5 2%	\$659	5 2%	\$537	5 5%
[8] Amortization of intangibles	\$19	0 3%	-	-	-	-	-	-	\$7	0 1%	\$49	0 4%	\$54	0 4%	\$55	0 6%
[9] Restructuring and other, net	\$4	0 1%	\$9	0 1%	\$59	0 9%	-	-	\$4	0 0%	\$29	0 3%	\$88	0 7%	\$210	2 1%
[10] Gain on arbitration award, net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[11] Impairment of other long-lived assets, net of recoveries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$2,320	23 7%
[12] Total Operating Expenses	\$1,219	20 0%	\$1,036	16 0%	\$1,015	16 3%	\$951	12 6%	\$1,263	13 7%	\$1,571	13 8%	\$1,829	14 4%	\$4,075	41 6%
[13] Income from Operations	\$374	6 1%	\$691	10 7%	\$444	7 1%	\$722	9 6%	\$874	9 5%	\$614	5 4%	\$1,376	10 8%	(\$2,665)	(27 2%)
[14] Non Operating Income (Expenses)																
[15] Interest Income	-	-	-	-	-	-	\$36	0 5%	\$69	0 7%	\$73	0 6%	\$57	0 4%	\$17	0 2%
[16] Interest Expense	-	-	-	-	-	-	(\$48)	(0 6%)	(\$41)	(0 4%)	(\$141)	(1 2%)	(\$137)	(1 1%)	(\$143)	(1 5%)
[17] Other Income (Expense), net	(\$135)	(2 2%)	(\$31)	(0 5%)	(\$16)	(0 3%)	\$22	0 3%	\$22	0 2%	\$15	0 1%	\$22	0 2%	(\$23)	(0 2%)
[18] Total Non Operating Income (Expenses)	(\$135)	(2 2%)	(\$31)	(0 5%)	(\$16)	(0 3%)	\$10	0 1%	\$50	0 5%	(\$53)	(0 5%)	(\$58)	(0 5%)	(\$149)	(1 5%)
[19] Income before Income Taxes	\$239	3 9%	\$660	10 2%	\$428	6 9%	\$732	9 7%	\$924	10 0%	\$561	4 9%	\$1,318	10 4%	(\$2,814)	(28 7%)
[20] (Benefits from) Provision for Income Taxes	\$86	1 4%	\$19	0 3%	(\$101)	(1 6%)	\$25	0 3%	\$84	0 9%	(\$352)	(3 1%)	\$67	0 5%	\$311	3 2%
[21] Net Income	\$153	2 5%	\$641	9 9%	\$529	8 5%	\$707	9 4%	\$840	9 1%	\$913	8 0%	\$1,251	9 8%	(\$3,125)	(31 9%)



TAB 3

SEAGATE TECHNOLOGY PLC  
CONSOLIDATED STATEMENT OF INCOME  
FY2002 – FY2017

	FY2010		FY2011		FY2012		FY2013		FY2014		FY2015		FY2016		FY2017	
	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%
[1] Revenue	\$11,395	100 0%	\$10,971	100 0%	\$14,939	100 0%	\$14,351	100 0%	\$13,724	100 0%	\$13,739	100 0%	\$11,160	100 0%	\$10,771	100 0%
[2] HDD Revenue	N/A	-	N/A	-	\$14,777	98 9%	\$14,167	98 7%	\$13,446	98 0%	\$12,867	93 7%	\$10,269	92 0%	\$9,885	91 8%
[3] Cost of Revenue	\$8,191	71 9%	\$8,825	80 4%	\$10,255	68 6%	\$10,411	72 5%	\$9,878	72 0%	\$9,930	72 3%	\$8,545	76 6%	\$7,597	70 5%
[4] Gross Profit	\$3,204	28 1%	\$2,146	19 6%	\$4,684	31 4%	\$3,940	27 5%	\$3,846	28 0%	\$3,809	27 7%	\$2,615	23 4%	\$3,174	29 5%
[5] Operating Expenses																
[6] Product development	\$877	7 7%	\$875	8 0%	\$1,006	6 7%	\$1,133	7 9%	\$1,226	8 9%	\$1,353	9 8%	\$1,237	11 1%	\$1,232	11 4%
[7] Marketing and administrative	\$437	3 8%	\$445	4 1%	\$528	3 5%	\$635	4 4%	\$722	5 3%	\$857	6 2%	\$635	5 7%	\$606	5 6%
[8] Amortization of intangibles	\$27	0 2%	\$2	0 0%	\$38	0 3%	\$79	0 6%	\$98	0 7%	\$129	0 9%	\$123	1 1%	\$104	1 0%
[9] Restructuring and other, net	\$66	0 6%	\$18	0 2%	\$4	0 0%	\$2	0 0%	\$24	0 2%	\$32	0 2%	\$175	1 6%	\$178	1 7%
[10] Gain on arbitration award, net	-	-	-	-	-	-	-	-	-	-	(\$620)	(4 5%)	-	-	-	-
[11] Impairment of other long-lived assets, net of recoveries	\$57	0 5%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[12] Total Operating Expenses	\$1,464	12 8%	\$1,340	12 2%	\$1,576	10 5%	\$1,849	12 9%	\$2,070	15 1%	\$1,751	12 7%	\$2,170	19 4%	\$2,120	19 7%
[13] Income from Operations	\$1,740	15 3%	\$806	7 3%	\$3,108	20 8%	\$2,091	14 6%	\$1,776	12 9%	\$2,058	15 0%	\$445	4 0%	\$1,054	9 8%
[14] Non Operating Income (Expenses)																
[15] Interest Income	\$6	0 1%	\$7	0 1%	\$8	0 1%	\$8	0 1%	\$8	0 1%	\$6	0 0%	\$3	0 0%	\$12	0 1%
[16] Interest Expense	(\$174)	(1 5%)	(\$214)	(2 0%)	(\$241)	(1 6%)	(\$214)	(1 5%)	(\$195)	(1 4%)	(\$207)	(1 5%)	(\$193)	(1 7%)	(\$222)	(2 1%)
[17] Other Income (Expense), net	(\$3)	(0 0%)	(\$20)	(0 2%)	\$7	0 0%	(\$54)	(0 4%)	(\$33)	(0 2%)	\$113	0 8%	\$19	0 2%	(\$29)	(0 3%)
[18] Total Non Operating Income (Expenses)	(\$171)	(1 5%)	(\$227)	(2 1%)	(\$226)	(1 5%)	(\$260)	(1 8%)	(\$220)	(1 6%)	(\$88)	(0 6%)	(\$171)	(1 5%)	(\$239)	(2 2%)
[19] Income before Income Taxes	\$1,569	13 8%	\$579	5 3%	\$2,882	19 3%	\$1,831	12 8%	\$1,556	11 3%	\$1,970	14 3%	\$274	2 5%	\$815	7 6%
[20] (Benefits from) Provision for Income Taxes	(\$40)	(0 4%)	\$68	0 6%	\$20	0 1%	(\$7)	(0 0%)	(\$14)	(0 1%)	\$228	1 7%	\$26	0 2%	\$43	0 4%
[21] Net Income	\$1,609	14 1%	\$511	4 7%	\$2,862	19 2%	\$1,838	12 8%	\$1,570	11 4%	\$1,742	12 7%	\$248	2 2%	\$772	7 2%

Notes & Sources:

In millions except for percentages Percentages based on revenue

FY2017, FY2016, and FY2015 data from Seagate Technology PLC Form 10-K for the period ending June 30, 2017, at 52

FY2014 data from Seagate Technology PLC Form 10-K for the period ending July 1, 2016, at 64

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FY2003 data from Seagate Technology Form 10-K for the period ending July 1, 2005, at 28

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HDD Revenue from Fiscal Q2 2016 Supplemental Financial Information, at 6; Fiscal Q3 2018 Supplemental Financial Information, at 5; Fiscal Q1 2015 Supplemental Financial Information, at 6 and 9;

Fiscal Q1 2014 Supplemental Financial Information, at 6 and 9

[4] = [1] - [3]

[12] = Sum of [6] through [11]

Average gross margin and operating margin from FY2002 to FY2006 are 24 3% and 8 6%, respectively; Computed as the average of rows [4] and [13] for FY2002 through 2006

Average gross margin and operating margin from FY2007 to FY2017 are 24 9% and 8 1%, respectively; Computed as the average of rows [4] and [13] for FY2007 through 2017

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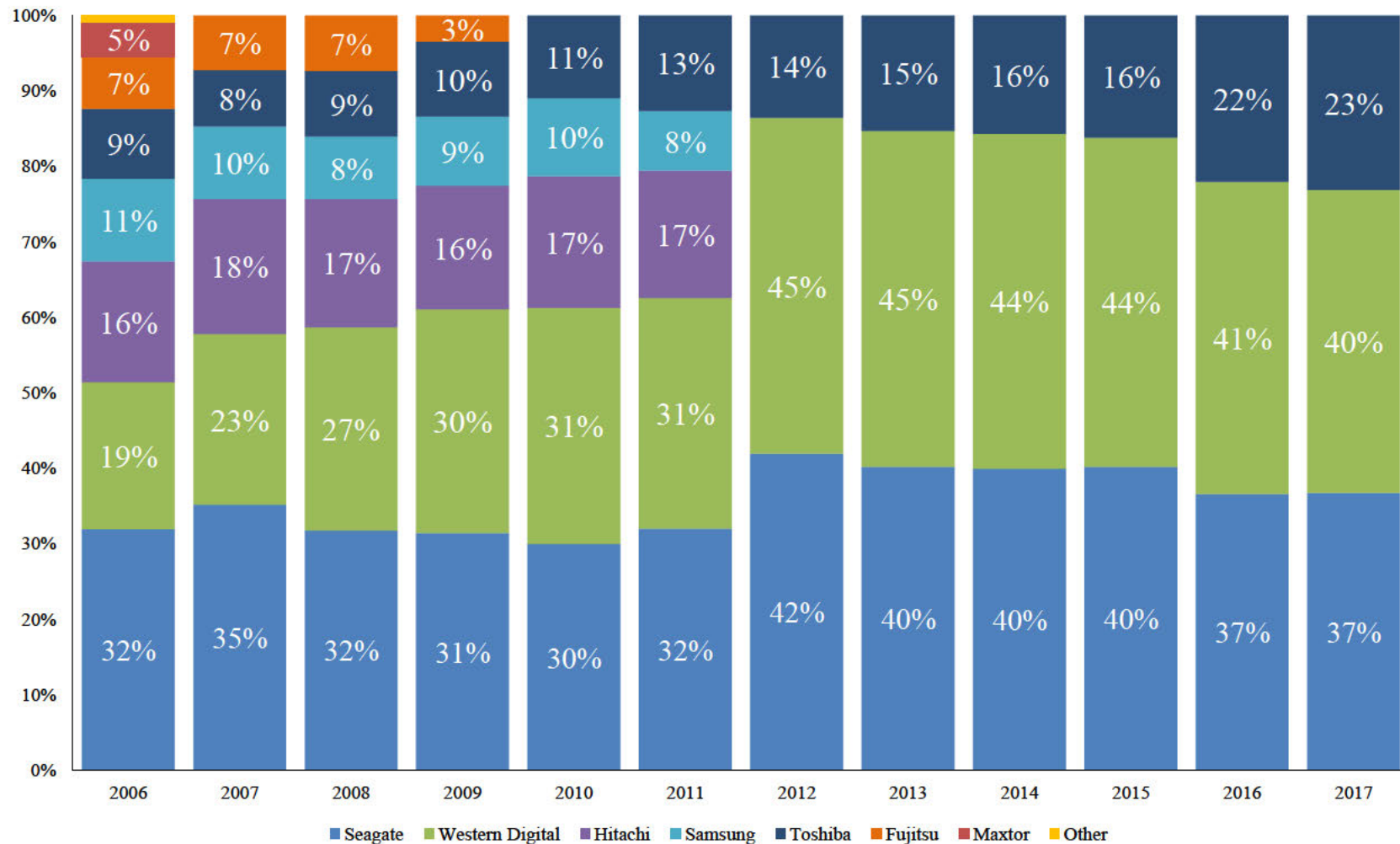
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TAB 4

## ANNUAL HDD SHARE BY VENDOR

## UNIT SHIPMENTS

2006 – 2017



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**TAB 4**

**ANNUAL HDD SHARE BY VENDOR  
UNIT SHIPMENTS  
2006 – 2017**

Notes & Sources:

2006 data from "Hard Disk Drive Sector Update CES Places Positive Spin on Hard Drive Sector," UBS, January 9, 2008, at 7. Other includes Excelstor, GS Magicstor, and Cornice.

2007 – 2010 data from "Electronic Components HDD Industry Consolidation and Implications for Japan's Firms," MorganStanley MUFG, April 18, 2011, at 4.

2011 – 2013 data from "Electronic Components TSR HDD Seminar: HDD Volumes to Recover from Jul-Sep, SSDs a Rising Threat," MorganStanley MUFG, April 16, 2015, at 2.

2014 – 2017 data from "Electronic Components February HDD Output: Expect Ongoing Decline in PC HDD Ratio, Growth in NL Demand," MorganStanley MUFG, March 30, 2018, at 4.

In 2012 and onward, Market Shares of Hitachi Global Storage Technologies (HGST) are combined with Market Shares of Western Digital.

See <https://www.wdc.com/about-wd/newsroom/announcements/wdc-acquires-hgst.html> (accessed May 4, 2018).

[REDACTED]

[REDACTED]

[illegible]



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TAB 6

	Licensor	Licensee	Effective Date	License Type	Pertains Patents or Products	Patent Count	Products, Apparatus and/or Services Covered by Agreement	Scope	Related to HDD	Term	Royalty Payment			Notes	Patents and/or Other IP	Sources
											Lump Sum	Running Royalty	Royalty Base			
[1]	Censtor Corp ("Censtor")	Seagate Technology LLC ("Seagate")	3/7/2002	One-way patent license	Patents	Patent Count Unavailable	Disk drives and other products and processes having data storage applications.	Worldwide, non-exclusive, perpetual license, without the right to sublicense, under all Censtor Patents to manufacture, have manufactured, import, use, lease, sell, and otherwise transfer disk drives and other products and processes having data storage applications.	Yes	N/A	Seagate pays \$1,000,000 within ten days of the Effective Date and \$1,000,000 at the one year anniversary of the Effective Date as license fee.	N/A	N/A	In the event that Seagate ships in commercial volume any product incorporating "Vertical Recording," Seagate agrees to pay Censtor a one-time payment of \$2,000,000.  Includes Exhibit A titled Alternative Dispute Resolution Agreement.	Censtor Patents include all patents and patent applications filed or granted before or after the Effective Date.	SEA00183901 - SEA00183912.
[2]																SEA00183913 - SEA00183920.
[3]	Forschungszentrum Julich GmbH ("Forschungszentrum Julich")	Seagate Technology, Inc. ("Seagate")	7/24/1997	One-way patent license	Patents	4	Licensed Products include GMR-heads for magnetic hard disc drives including fixed disc and cartridge type drives, magnetic hard disc drives subsystems and magnetic tape drives and the components related to these products.	Non-exclusive worldwide license to use, design, manufacture, market, sell or otherwise dispose of the contractual products, and to have made the contractual products by another manufacturer for the sale, use or other disposal by Seagate.	Yes	Until expiry of the last contractual protective right.	Seagate pays \$1,200,000 in three equal annual installments as license fee.	N/A	N/A	N/A	German Patent 38 20 475  EPA-Patent 0346817  US-Patent 4,949,039  Japanese Patent 2 651 015	SEA00183921 - SEA00183927.
[4]																United States Patent No. 5,691,037  Canada Application No. 2206301  EPO Application No. 95 943432.5  Japan Application No. 521664/96  Korea Application No. 97-704821  Mexico Application No. 974789  Singapore Application No. 9702561-3
[5]	Syndia Corporation ("Syndia")	Seagate Technology Holdings ("Seagate")	12/25/2001	One-way patent license	Patents	33	Licensed Product includes any disc drive, disc drive component or semiconductor product made or covered by a Licensed Patent.	Syndia grants Seagate a non-exclusive, and fully paid-up license under the Licensed Patents to practice any inventions or make, have made, use, sell, and lease any Licensed Products.	Yes	Until the expiration of the last to expire of the Licensed Patents.	Seagate pays Syndia a one time fee of \$700,000.	N/A	N/A	Includes Covenant Not to Sue.  Lump sum payment includes payments for license and covenant not to sue.	Licensed Patent includes U.S. Patent Nos. 4,367,130; 4,385,880; 4,702,808; 4,859,493; 4,874,596; 4,960,643; 4,974,498; 5,021,628; 5,040,501; 5,067,826; 5,096,352; 5,131,941; 5,132,587; 5,235,929; 5,284,394; 5,288,556; 5,332,348; 5,349,265; 5,456,406; 5,462,772; 5,529,815; 5,616,372; 5,626,881; 5,688,557; 5,714,202; 5,740,941; 5,786,038; 5,794,801; 5,866,195; 5,871,805; 6,083,570; 6,099,976; 6,165,616.	SEA00184216 - SEA00184223.

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Page 4 of 12

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</p>	<p> <b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b> <b>7</b> <b>8</b> <b>9</b> <b>10</b> <b>11</b> <b>12</b> <b>13</b> <b>14</b> <b>15</b> <b>16</b> <b>17</b> <b>18</b> <b>19</b> <b>20</b> <b>21</b> <b>22</b> <b>23</b> <b>24</b> <b>25</b> <b>26</b> <b>27</b> <b>28</b> <b>29</b> <b>30</b> <b>31</b> <b>32</b> <b>33</b> <b>34</b> <b>35</b> <b>36</b> <b>37</b> <b>38</b> <b>39</b> <b>40</b> <b>41</b> <b>42</b> <b>43</b> <b>44</b> <b>45</b> <b>46</b> <b>47</b> <b>48</b> <b>49</b> <b>50</b> <b>51</b> <b>52</b> <b>53</b> <b>54</b> <b>55</b> <b>56</b> <b>57</b> <b>58</b> <b>59</b> <b>60</b> <b>61</b> <b>62</b> <b>63</b> <b>64</b> <b>65</b> <b>66</b> <b>67</b> <b>68</b> <b>69</b> <b>70</b> <b>71</b> <b>72</b> <b>73</b> <b>74</b> <b>75</b> <b>76</b> <b>77</b> <b>78</b> <b>79</b> <b>80</b> <b>81</b> <b>82</b> <b>83</b> <b>84</b> <b>85</b> <b>86</b> <b>87</b> <b>88</b> <b>89</b> <b>90</b> <b>91</b> <b>92</b> <b>93</b> <b>94</b> <b>95</b> <b>96</b> <b>97</b> <b>98</b> <b>99</b> <b>100</b> 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</p>	<p> <b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b> <b>7</b> <b>8</b> <b>9</b> <b>10</b> <b>11</b> <b>12</b> <b>13</b> <b>14</b> <b>15</b> <b>16</b> <b>17</b> <b>18</b> <b>19</b> <b>20</b> <b>21</b> <b>22</b> <b>23</b> <b>24</b> <b>25</b> <b>26</b> <b>27</b> <b>28</b> <b>29</b> <b>30</b> <b>31</b> <b>32</b> <b>33</b> <b>34</b> <b>35</b> <b>36</b> <b>37</b> <b>38</b> <b>39</b> <b>40</b> <b>41</b> <b>42</b> <b>43</b> <b>44</b> <b>45</b> <b>46</b> <b>47</b> <b>48</b> <b>49</b> <b>50</b> <b>51</b> <b>52</b> <b>53</b> <b>54</b> <b>55</b> <b>56</b> <b>57</b> <b>58</b> <b>59</b> <b>60</b> <b>61</b> <b>62</b> <b>63</b> <b>64</b> <b>65</b> <b>66</b> <b>67</b> <b>68</b> <b>69</b> <b>70</b> <b>71</b> <b>72</b> <b>73</b> <b>74</b> <b>75</b> <b>76</b> <b>77</b> <b>78</b> <b>79</b> <b>80</b> <b>81</b> <b>82</b> <b>83</b> <b>84</b> <b>85</b> <b>86</b> <b>87</b> <b>88</b> <b>89</b> <b>90</b> <b>91</b> <b>92</b> <b>93</b> <b>94</b> <b>95</b> <b>96</b> <b>97</b> <b>98</b> <b>99</b> <b>100</b> </p>	<p> <b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b> <b>7</b> <b>8</b> <b>9</b> <b>10</b> <b>11</b> <b>12</b> <b>13</b> <b>14</b> <b>15</b> <b>16</b> <b>17</b> <b>18</b> <b>19</b> <b>20</b> <b>21</b> <b>22</b> <b>23</b> <b>24</b> <b>25</b> <b>26</b> <b>27</b> <b>28</b> <b>29</b> <b>30</b> <b>31</b> <b>32</b> <b>33</b> <b>34</b> <b>35</b> <b>36</b> <b>37</b> <b>38</b> <b>39</b> <b>40</b> <b>41</b> <b>42</b> <b>43</b> <b>44</b> <b>45</b> <b>46</b> <b>47</b> <b>48</b> <b>49</b> <b>50</b> <b>51</b> <b>52</b> <b>53</b> <b>54</b> <b>55</b> <b>56</b> <b>57</b> <b>58</b> <b>59</b> <b>60</b> <b>61</b> <b>62</b> <b>63</b> <b>64</b> <b>65</b> <b>66</b> <b>67</b> <b>68</b> <b>69</b> <b>70</b> <b>71</b> <b>72</b> <b>73</b> <b>74</b> <b>75</b> <b>76</b> <b>77</b> <b>78</b> <b>79</b> <b>80</b> <b>81</b> <b>82</b> <b>83</b> <b>84</b> <b>85</b> <b>86</b> <b>87</b> <b>88</b> <b>89</b> <b>90</b> <b>91</b> <b>92</b> <b>93</b> <b>94</b> <b>95</b> <b>96</b> <b>97</b> <b>98</b> <b>99</b> <b>100</b> </p>	<p> <b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b> <b>7</b> <b>8</b> &lt;</p>
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TAB 6

[REDACTED]															
Licensor	Licensee	Effective Date	License Type	Pertains Patent or Product	Patent Count	Products, Apparatus and/or Services Covered by Agreement	Scope	Related to HDD	Term	Lump Sum	Running Royalty	Royalty Base	Notes	Patents and/or Other IP	Source
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

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CONFIDENTIAL-ATTORNEY EYES ONLY INFORMATION  
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TAB 7

[6] Intellectual

CONFIDENTIAL ATTORNEY EYES ONLY INFORMATION  
(also contains Third Party designated Outside Counsel's Eyes Only Information)

TAB 7

[REDACTED]

[REDACTED]

[REDACTED]

CONFIDENTIAL ATTORNEY EYES ONLY INFORMATION

(also contains Third Party designated Outside Counsel's Eyes Only Information)

**TAB 8**

**SEAGATE HDD-RELATED AGREEMENTS  
THAT INCLUDE ONE-WAY PATENT LICENSES  
PAYMENT SUMMARY STATISTICS**

One-way patent licenses:

- 
- [1] Number of Related Patents
  - [2] Maximum
  - [3] Minimum
  - [4] Median
  - [5] Average
  - [6] Number of Agreements

7

All one-way patent licenses, including settlement agreements:

- 
- [7] Number of Related Patents
  - [8] Maximum
  - [9] Minimum
  - [10] Median
  - [11] Average
  - [12] Number of Agreements

14

Notes & Sources:

From Tab 7.

*See* SEA00183913 - SEA00183920.

Agreements considered:

- [1]-[6] SEA00183901 - SEA00183912.  
SEA00183913 - SEA00183920.  
SEA00183921 - SEA00183927.  
SEA00184153 - SEA00184167.  
SEA00184216 - SEA00184223.  
SEA00500953 - SEA00501057.  
SEA00502145 - SEA00502160.
- [7]-[12] SEA00183901 - SEA00183912.  
SEA00183913 - SEA00183920.  
SEA00183921 - SEA00183927.  
SEA00184153 - SEA00184167.



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**TAB 8**

**SEAGATE HDD-RELATED AGREEMENTS  
THAT INCLUDE ONE-WAY PATENT LICENSES  
PAYMENT SUMMARY STATISTICS**

SEA00184216 - SEA00184223.  
SEA00500953 - SEA00501057.  
SEA00502145 - SEA00502160.  
SEA02730761 - SEA02730834.  
SEA00184041 - SEA00184050.  
SEA00184248 - SEA00184251.  
SEA00500892 - SEA00500896.  
SEA00500897 - SEA00500927.  
SEA00500943 - SEA00500952.  
SEA00502107 - SEA00502144.

**ESTIMATED LUMP SUM PAYMENTS  
BASED ON 2017 LMS-TDK SETTLEMENT  
APRIL 2011 – AUGUST 2022**

		April 2010 - December 2017		April 2016 - December 2017		April 2010 - January 2018		April 2016 - January 2018	
Year		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
2010	2011								
2011	2012								
2012	2013								
2013	2014								
2014	2015								
2015	2016								
2016	2017								
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2077	2078								
2078	2079								
2079	2080								
2080	2081								

**TAB 9**

**ESTIMATED LUMP SUM PAYMENTS  
BASED ON 2017 LMS-TDK SETTLEMENT  
APRIL 2011 – AUGUST 2022**

Notes & Sources:

[1]-[14] From Lawton Report Table 9.1, at 567. 2011 TDK Head WW Shipments prorated to include April 1, 2011 through December 31, 2011 only. 2022 TDK Head WW Shipments prorated to include January 1, 2022 through August 22, 2022 only.

[15] = [14] / [13].

[16][A],[18][A],[20][A] From Lawton Report, at Schedule A.1.

[16][B],[18][B],[20][B] From Lawton Report, at Schedule A.2.

[16][C],[18][C],[20][C] From Lawton Report, at Schedule C.1. Royalty base is only available for Scenario 1.

[16][D],[18][D],[20][D] From Lawton Report, at Schedule C.2. Royalty base is only available for Scenario 1.

[17] = [15] \* [16].

[19][A] = [15][A] \* [18][A].

[19][B] = [15][B] \* [18][B].

[21][A] = [15][A] \* [20][A].

[21][B] = [15][B] \* [20][B].

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TAB 10

FY2010 – FY2016

FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	Total of FY2011 – FY2015
[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]

Normandale, U.S.

Notes & Sources:  
In USD thousands, except Effective Transfer Price, Unit Cost and Gross Profit per Unit.

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**TAB 10**

**SEAGATE TECHNOLOGY LLC  
WAFER LEVEL SLIDER INTERCOMPANY TRANSFER PRICING  
FY2010 – FY2016**

[8] = [1] / [7].

[9] = [2] / [7].

[10] = [8] + [9].

[15] = [13] + [14].

[18] = [11] / [17].

[19] = [12] / [17].

[20] = [18] + [19].

[21] = [1] + [11].

[22] = [7] + [17].

[23] = [21] / [22].

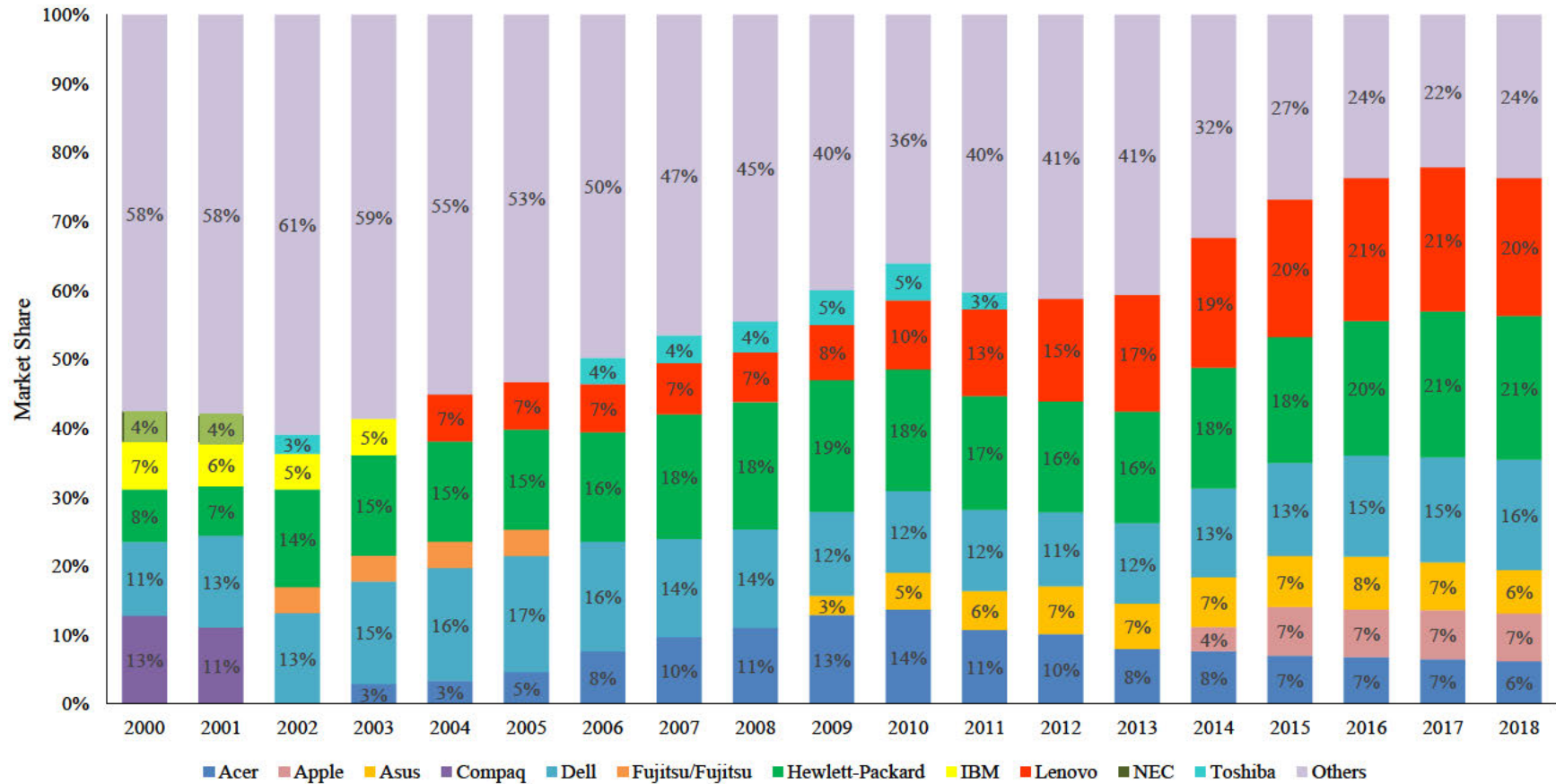
[H] Sum is taken from FY2011 to FY2015 due to data unavailability in FY2010 and FY2016.

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TAB 11

**WORLDWIDE PC SHIPMENTS  
MARKET SHARE  
2000 – 2018 Q1**



**TAB 11**

**WORLDWIDE PC SHIPMENTS**

**MARKET SHARE**

**2000 – 2018 Q1**

Notes & Sources:

2009 through 2018 from statistic\_id263393, "Quarterly PC Shipments Worldwide 2009-2018, by Vendor."

2007 through 2008 from <https://www.gartner.com/newsroom/id/856712> (accessed June 14, 2018).

2006 from <https://www.gartner.com/newsroom/id/584210> (accessed June 14, 2018).

2004 through 2005 from <https://www.gartner.com/newsroom/id/492237> (accessed June 14, 2018).

2003 from <https://www.gartner.com/newsroom/id/492098> (accessed June 14, 2018).

2002 from <https://www.businesswire.com/news/home/20040114005815/en/Gartner-PC-Vendors-Experienced-Happy-Holiday-Season> (accessed June 14, 2018).

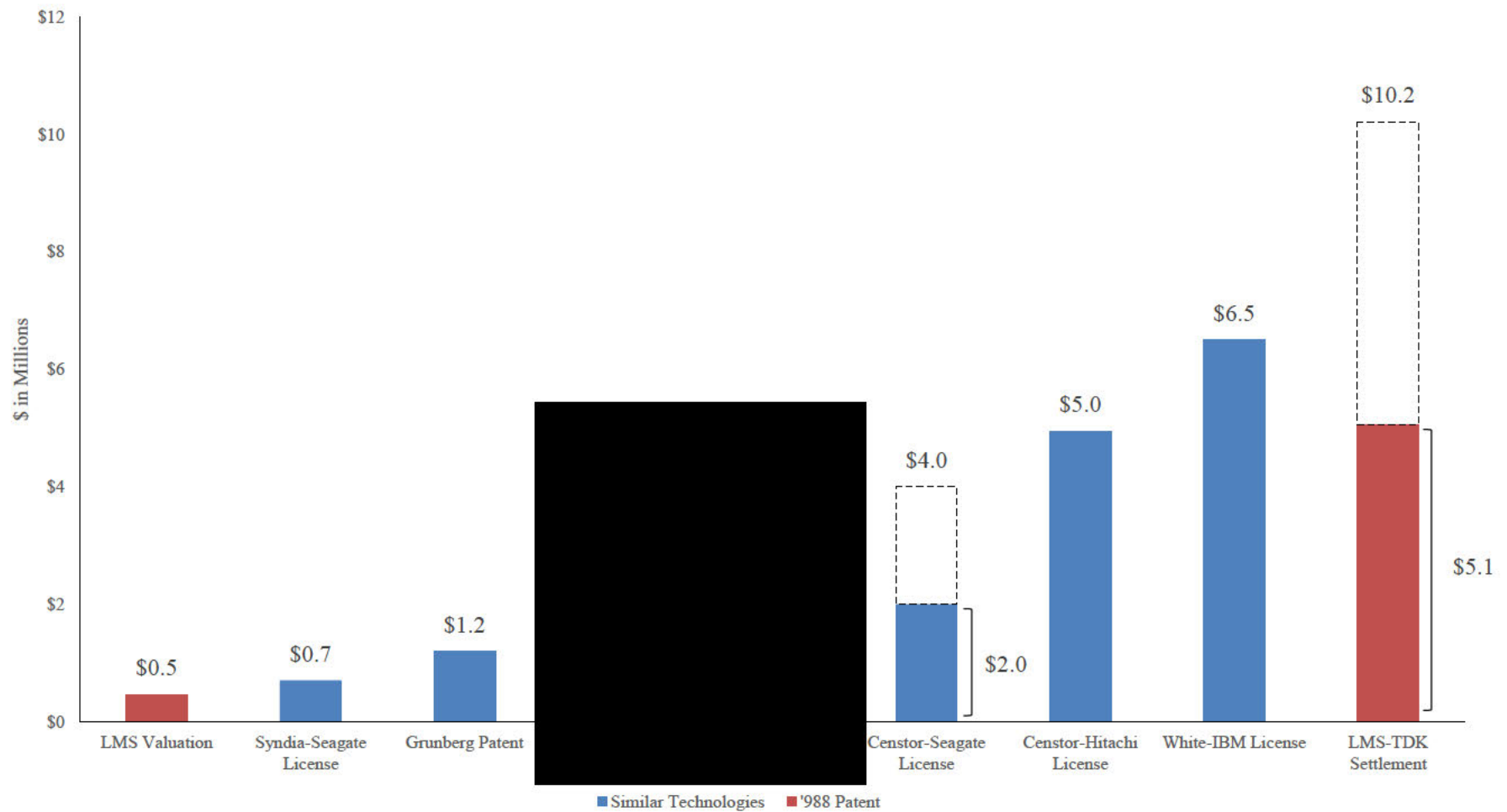
2000 through 2001 from <http://tech-insider.org/statistics/research/2002/0117.html> (accessed June 14, 2018).



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TAB 12

**AGREEMENTS, ALLOCATIONS, AND VALUATIONS  
'988 PATENT AND SIMILAR TECHNOLOGIES**

**TAB 12**

**AGREEMENTS, ALLOCATIONS, AND VALUATIONS  
'988 PATENT AND SIMILAR TECHNOLOGIES**

Notes & Sources:

LMS Valuation from Lambeth 02/26 Deposition, at 83-85.

Syndia-Seagate License from SEA00184216-223, at 218.

Grunberg Patent from SEA00183921-927, at 924.

Allocation from Samsung Agreement from Mitchell Deposition, at 45.

[REDACTED]

[REDACTED]

Censtor-Seagate License from SEA00183901-912, at 902. Seagate pays \$1,000,000 within ten days of the Effective Date and \$1,000,000 at the one year anniversary of the Effective Date. Also includes \$2,000,000 that would be paid by Seagate to Censtor in the event that Seagate ships in commercial volume any product incorporating "Vertical Recording."

Censtor-Hitachi License from LAMBETH-000276068-153, at 074.

White-IBM License from Lawton report, at ¶831.

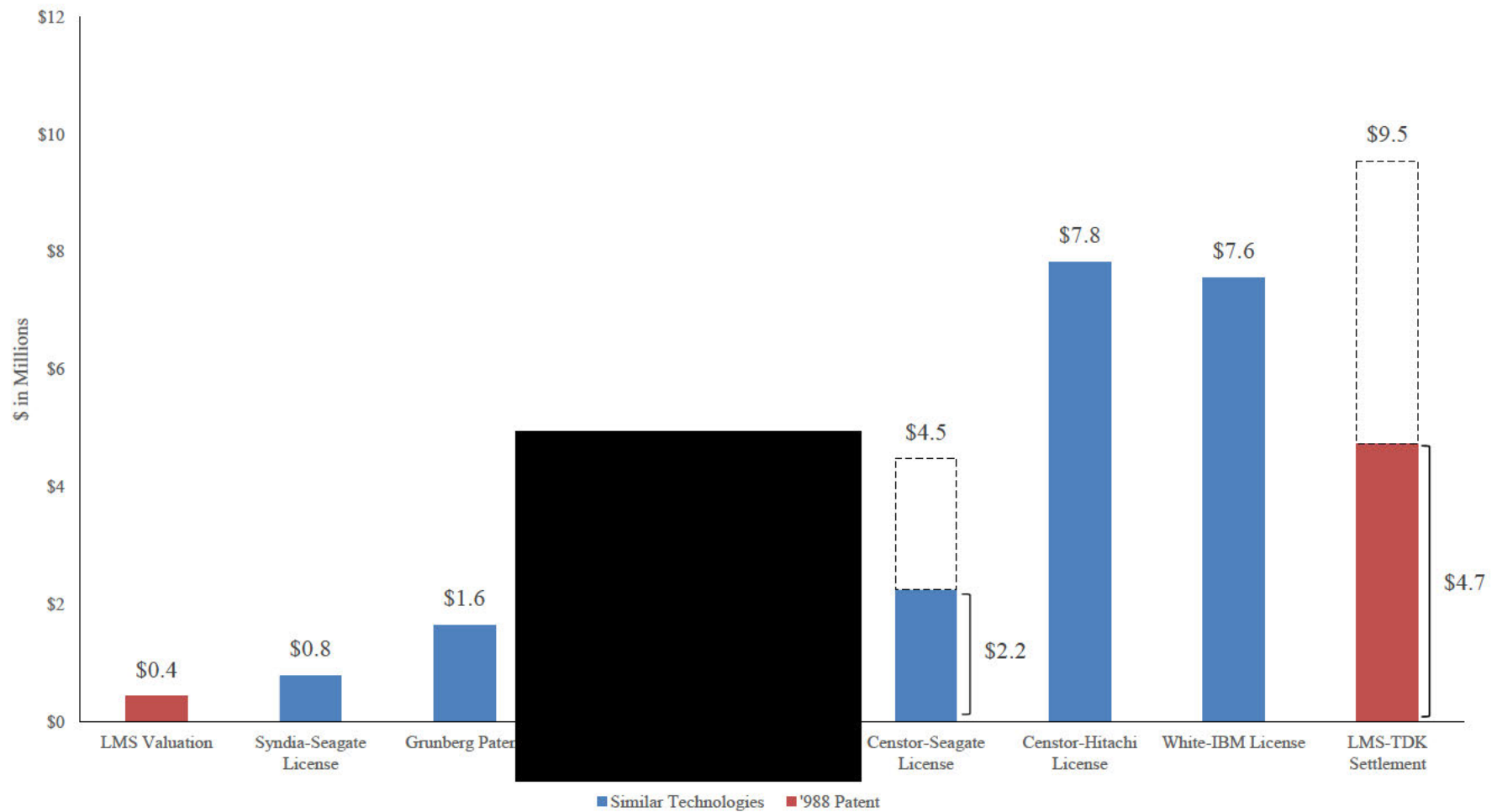
LMS-TDK Settlement from Tab 9. Damages amounts range from \$5.1 million to \$10.2 million.

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TAB 13

**AGREEMENTS, ALLOCATIONS, AND VALUATIONS**  
**'988 PATENT AND SIMILAR TECHNOLOGIES**  
**ADJUSTED FOR INFLATION TO 2006**



**TAB 13**

**AGREEMENTS, ALLOCATIONS, AND VALUATIONS  
'988 PATENT AND SIMILAR TECHNOLOGIES  
ADJUSTED FOR INFLATION TO 2006**

Notes & Sources:

Dollar amounts as of Hypothetical Negotiation date. Amounts adjusted for inflation using 3-Month Treasury Bill rate from [https://fred.stlouisfed.org/series/](https://fred.stlouisfed.org/series/WTB3MS#0)

WTB3MS#0 (accessed July 16, 2018); Tab 18.

LMS Valuation from Lambeth 02/26 Deposition, at 83-85.

Syndia-Seagate License from SEA00184216-223, at 216 and 218.

Grunberg Patent from SEA00183921-927, at 924 and 926.

Allocation from Samsung Agreement from Mitchell Deposition, at 38 and 45.

[REDACTED]

Censtor-Seagate License from SEA00183901-912, at 901 and 902. Seagate pays \$1,000,000 within ten days of the Effective Date and \$1,000,000 at the one year anniversary of the Effective Date. Also includes \$2,000,000 that would be paid by Seagate to Censtor in the event that Seagate ships in commercial volume any product incorporating "Vertical Recording."

Censtor-Hitachi License from LAMBETH-000276068-153, at 074; Tab 15.

White-IBM License from Lawton report, at ¶831.

LMS-TDK Settlement from Tab 9. Inflation adjusted Damages amounts range from \$4.7 million to \$9.5 million; 30(b)(6) Deposition of David N. Lambeth, February 23, 2019, Exhibit 22 (LAMBETH-000222078-098).

## TAB 14

3-MONTH TREASURY BILL RATE  
1993 Q1 – 2018 Q2

		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
[1]	Q1	2.98%	3.24%	5.73%	4.93%	5.06%	5.06%	4.41%	5.53%	4.82%	1.72%	1.16%	0.91%	2.53%
[2]	Q2	2.96%	3.95%	5.59%	5.02%	5.05%	4.98%	4.44%	5.71%	3.66%	1.71%	1.04%	1.06%	2.85%
[3]	Q3	3.01%	4.46%	5.37%	5.10%	5.05%	4.85%	4.65%	6.02%	3.21%	1.65%	0.93%	1.47%	3.35%
[4]	Q4	3.05%	5.28%	5.26%	4.97%	5.08%	4.25%	5.03%	6.02%	1.92%	1.35%	0.92%	1.99%	3.83%
[5]	Annual	3.03%	4.30%	5.60%	5.10%	5.16%	4.87%	4.71%	5.95%	3.44%	1.62%	1.02%	1.37%	3.18%
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
[6]	Q1	4.39%	4.98%	2.09%	0.20%	0.10%	0.13%	0.07%	0.09%	0.05%	0.02%	0.29%	0.60%	1.56%
[7]	Q2	4.71%	4.74%	1.62%	0.17%	0.15%	0.05%	0.09%	0.05%	0.03%	0.02%	0.26%	0.89%	1.84%
[8]	Q3	4.91%	4.32%	1.53%	0.16%	0.15%	0.02%	0.10%	0.03%	0.03%	0.04%	0.30%	1.04%	N/A
[9]	Q4	4.90%	3.41%	0.33%	0.06%	0.14%	0.02%	0.09%	0.06%	0.02%	0.11%	0.43%	1.21%	N/A
[10]	Annual	4.81%	4.43%	1.40%	0.15%	0.14%	0.05%	0.09%	0.06%	0.03%	0.05%	0.32%	0.94%	N/A

Notes & Sources:3-Month Treasury Bill rate from <https://fred.stlouisfed.org/series/WTB3MS#0> (accessed July 16, 2018).[1]-[4],[6]-[9] Represents yields in percent per annum. *See* <https://www.federalreserve.gov/releases/h15/> (accessed July 11, 2018).

[5],[10] Represents the annual yield based on the yields of the four quarters.

TAB 15

**CENSTOR LICENSEE  
HDD UNIT SHIPMENT**

	Licensor	Licensee	License Effective Date	Lump Sum Royalty Payment	Licensee's HDD Unit Shipment
	[A]	[B]	[C]	[D]	[E]
[1]	Censtor Corp	Fujitsu Limited	2/28/1991	\$9,200,000	N/A
[2]	Censtor Corp	Maxtor Corporation	9/23/1991	\$2,200,000	2,476,840
[3]	Censtor Corp	International Business Machines	6/1/1993	\$4,500,000	4,408,100
[4]	Censtor Corp	MiniStor	December 1994	\$3,500,000	N/A
[5]	Censtor Corp	Hitachi, Ltd	12/19/1994	\$4,950,000	537,420
[6]	Censtor Corp	NEC Corporation	8/7/1995	\$3,300,000	447,850
[7]	Censtor Corp	Western Digital Technologies, Inc.	8/12/1996	\$3,000,000	15,300,000
[8]	Censtor Corp	Seagate Technology LLC	3/7/2002	\$4,000,000	60,975,600

Notes & Sources:

Worldwide HDD unit shipment data from StorageNewsletter, TrendFocus, and The Register.

1991-1993 and 2002 market share data from "The Hard Disk Drive Industry Overview," A.G. Edwards Analyst Report, August 21, 2006, at 11.

1994-1995 market share data from "Technology: Peripherals/Data Storage," Morgan Stanley, August 12, 1997, at 20.

HDD Market Share and Worldwide HDD unit shipments data are in calendar years.

LAMBETH-000276411-828, at 661-711; LAMBETH-000276411-828, at 615-648; LAMBETH-000276411-828, at 779-806;

LAMBETH-000275162-182, at 167; LAMBETH-000276068-153, at 083-153; LAMBETH-000276000-067, at 041-067;

SEA00183901-912; LAMBETH-000260377-794, at 440.

[1][D] Lump Sum Royalty payment includes license fees of \$5,200,000 and \$4,000,000 of non refundable payment in lieu of future royalty.

See LAMBETH-000260377-794, at 440.

[2][D] Lump Sum Royalty payment includes license fees of \$2,200,000. Does not include milestone achievement payment of \$3,000,000.

See LAMBETH-000260377-794, at 440.

[2][E] Calculated as 32.59 million (1991 worldwide HDD unit shipment) times 7.6% (1991 Maxtor HDD Market Share).

[3][D] LAMBETH-000260377-794, at 440.

[3][E] Calculated as 51.86 million (1993 worldwide HDD unit shipment) times 8.5% (1993 IBM HDD Market Share).

[4][D] Lump Sum Royalty Payment includes \$25,000 cash and \$3,475,000 promissory note.

[5][D] Lump Sum Royalty Payment from LAMBETH-000276068-153, at 074.

[5][E] Hitachi's 1995 HDD Market Share is used as proxy for 1994 HDD Market Share. Hitachi's HDD Market Share stayed consistent at 0.6% from

1995 to 1996. Calculated as 89.57 million (1995 worldwide HDD unit shipment) times 0.6% (1995 Hitachi HDD Market Share).

[6][E] Calculated as 89.57 million (1995 worldwide HDD unit shipment) times 0.5% (1995 NEC Corporation HDD Market Share).

[7][A]-[7][D] From Lawton Report, at 383.

[7][E] 1996 HDD Unit Shipment from 1996 Western Digital Summary Annual Report, at 6.

[8][D] Seagate pays \$1,000,000 within ten days of the Effective Date and \$1,000,000 at the one year anniversary of the Effective Date.

Also includes \$2,000,000 that would be paid by Seagate to Censtor in the event that Seagate ships in commercial volume any product incorporating "Vertical Recording." See SEA00183901-912, at 902.

[8][E] Calculated as 207.4 million (2002 worldwide HDD unit shipment) times 29.4% (2002 Seagate HDD Market Share).

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TAB 16

**WAFER LEVEL SLIDER UNITS  
BY INTERNAL PRODUCT NAME  
APRIL 2010 – DECEMBER 2017**

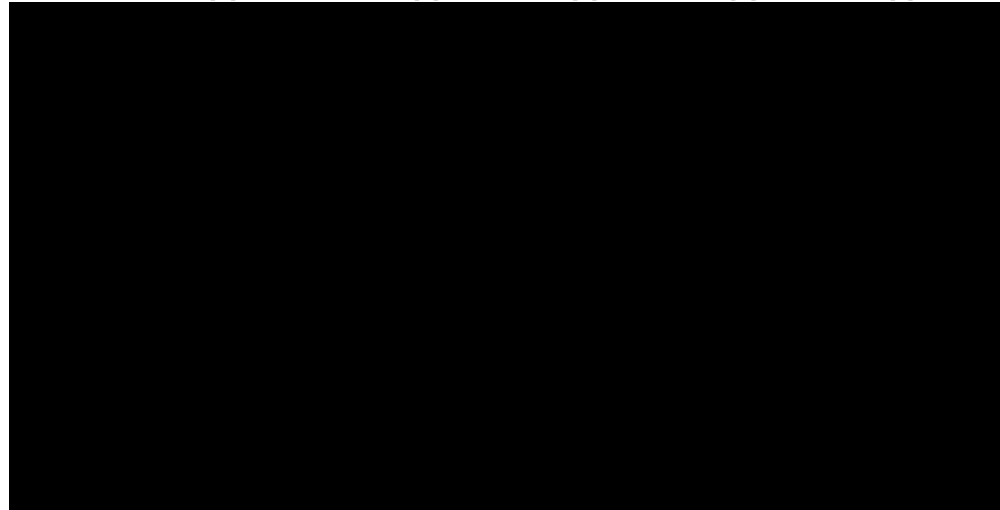
Internal Product Name	Wafer Level Slider			
	Minnesota		Northern Ireland	
	#	%	#	%
[A]	[B]	[C]	[D]	[E]
[1] AIRWALKER	160,795,799	100.0%	-	-
[2] AVENGER	51,701,399	100.0%	-	-
[3] BOGART	31,396,551	18.3%	139,733,153	81.7%
[4] BRINKS	-	-	12,528,431	100.0%
[5] CAMERON	17,428,254	100.0%	-	-
[6] CHENGAI	-	-	2,299,797	100.0%
[7] COMPASS	-	-	123,079,754	100.0%
[8] CRAWFORD	14,788,785	100.0%	-	-
[9] D8X	-	-	2,206,476	100.0%
[10] DESARU	44,226,526	63.9%	24,957,487	36.1%
[11] DRAGONFLY 2	-	-	11,422,057	100.0%
[12] EAGLE	-	-	245,068,230	100.0%
[13] EAGLERP	-	-	10,724,083	100.0%
[14] EMERALD	-	-	9,377,122	100.0%
[15] FIREFLY	-	-	39,207,234	100.0%
[16] FIRESTORM	23,709,975	100.0%	-	-
[17] GRENADA	462,556,037	33.8%	904,287,015	66.2%
[18] HORNET	-	-	21,552,265	100.0%
[19] HURRICANE	-	-	2,600,180	100.0%
[20] JULIUS1, SAPTA15	70,871,398	100.0%	-	-
[21] KESTREL	13,200,852	100.0%	-	-
[22] LAMARR	18,042,550	100.0%	-	-
[23] LIGHTNING	97,588,030	73.4%	35,319,711	26.6%
[24] LIGHTNING/THUNDERBU(	-	-	65,831,287	100.0%
[25] M10P	-	-	29,166,494	100.0%
[26] M8	-	-	35,130,026	100.0%
[27] M9T	-	-	75,557,834	100.0%
[28] MAKARA	137,807,674	62.0%	84,415,794	38.0%
[29] MAKARAPLUS	289,367,763	60.9%	185,862,543	39.1%
[30] MANTARAY	49,408,577	100.0%	-	-
[31] MDW	-	-	14,591,234	100.0%
[32] MDW MHT	-	-	1,478,176	100.0%
[33] MEGALODON	43,126,043	45.9%	50,870,910	54.1%
[34] MHT	-	-	54,780,888	100.0%
[35] MOBULA	44,194,503	81.0%	10,382,570	19.0%
[36] MOBULABP	11,621,368	100.0%	-	-
[37] MOOSE SUPERHAWK	-	-	7,597,681	100.0%
[38] NIGHTHAWK	-	-	8,171,049	100.0%

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**TAB 16**

**WAFER LEVEL SLIDER UNITS  
BY INTERNAL PRODUCT NAME  
APRIL 2010 – DECEMBER 2017**

Internal Product Name	Wafer Level Slider			
	Minnesota		Northern Ireland	
	#	%	#	%
[A]	[B]	[C]	[D]	[E]



Notes & Sources:

[B],[D] From SEA03336805.

[C] = [B] / ([B] + [D]).

[E] = [D] / ([B] + [D]).

[REDACTED]



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**Tab 17**

**FORWARD CITATION ANALYSIS**  
**THE '039 PATENT AND THE '988 PATENT**

To assess the relative contributions and values of the Grünberg patent (or the '039 Patent) and the '988 Patent to the HDD industry, I employed a forward citations analysis that is established in the economics literature and accepted in many patent litigations.<sup>1</sup> Specifically, I estimated a non-linear model for predicting forward citations (*i.e.*, the number of times a patent is referenced by subsequent patents as prior art). I assume that the number of cumulative forward citations a patent receives grows with patent age in a logistic functional form, and that the speed of accumulation may differ by the patent class, *i.e.*, field of technology.<sup>2</sup> As such, the model was constructed to adjust for age- and patent-class differences across patents.

$$citation\ number_i = (a + m * class_i) / (1 + (b * e^{-c * age_i})) + \varepsilon_i$$

This model was estimated using all U.S. patents issued in the last 50 years that were classified in the same patent classes as the '988 Patent (Class 428) and the '039 Patent (Class 324) in the U.S. Patent Classification System ("USPC").<sup>3</sup>

<sup>1</sup> See, e.g. Trajtenberg, Manuel, "A Penny for Your Quotes: Patent Citations and the Value of Innovations," *The Rand Journal of Economics* (1990): 172-87; Dietmar Harhoff, Francis Narin, Frederic M. Scherer, and Katrin Vopel, "Citation Frequency and the Value of Patented Inventions," *Review of Economics and Statistics* 81.3 (1999): 511-15; Dietmar Harhoff, Frederic Scherer, and Katrin Vopel, "Citation, Family size, Opposition and the Value of Patent Rights," *Research Policy*, 1596 (2002); Bronwyn H. Hall, Adam Jaffe, and Manuel Trajtenberg, "Market Value and Patent Citations," *RAND Journal of Economics* (2005): 16-38; "Petra Moser, Joerg Ohmstedt, and Paul W. Rhode. Patent citations and the size of patented inventions: Evidence from hybrid corn," No. w21443. National Bureau of Economic Research (2015); Leonid Kogan, Dimitris Papanikolaou, Amit Seru, and Noah Stoffman, "Technological Innovation, Resource Allocation, and Growth," *The Quarterly Journal of Economics* 132, no. 2 (2017): 665-712; *Comcast Cable Communs., LLC v. Sprint Communs. Co., LP*, 218 F. Supp. 3d 375, 382-384 (E.D. Penn. 2016) ("the forward citation method of analysis has been recognized in the academic literature as reliable since the 1990s... Dr. Cox's use of forward citation analysis in his expert opinion is therefore reliable under *Daubert*"); *Intel Corp. v. Future Link Sys., LLC*, No. 14-377, 2017 U.S. Dist. LEXIS 91699, at 9-16 (D. Del. June 8, 2017); *Better Mouse Co. v. SteelSeries ApS*, No. 14-198, 2016 U.S. Dist. LEXIS 16611, at 5-9 (E.D. Tex. Jan. 5, 2016); *PersonalWeb Techs. LLC v. IBM*, No. 16-1266, 2017 U.S. Dist. LEXIS 116422, at 6-8 (N.D. Cal. July 25, 2017).

<sup>2</sup> The logistic function form captures the pattern of forward citation accumulation identified in economics literature. After a patent issues, the speed at which it accumulates forward citations is slow at first, relatively fast in subsequently years, then decreases as time progresses to approach its life-time maximum citation number. See e.g. Bronwyn H. Hall, Adam B. Jaffe, and Manuel Trajtenberg. *The NBER Patent Citations Data File: Lessons, Insights and Methodological Tools*. No. w8498. National Bureau of Economic Research (2001), at Figure 9 and Figure 10.

<sup>3</sup> Data were provided by Claviate Analytics on June 5, 2018. The USPC is a system for organizing U.S. patents into relatively small collections based on "common subject matter." According to the USPTO, "[e]ach subject matter division in the USPC includes a major component called a class and a minor component called a subclass. A class generally delineates one technology from another. Subclasses delineate processes, structural features, and functional features of the subject matter encompassed within the scope of a class."

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For each patent  $i$ , the dependent variable – “citation number” – is the number of unadjusted forward citations that the patent has received to-date. The variable “class” is a dummy variable that equals 1 if a patent is in Class 324, and 0 otherwise. The variable “age” is the patent’s age measured in years, counting from its issuance date.  $a$ ,  $m$ ,  $b$ , and  $c$  are parameters that control the shape and curvature of the logistic functional form.

This model predicts the expected number of citations for a patent in Classes 428 and 324 at each given age. The residual term  $\varepsilon_i$  of the regression therefore reflects the number of forward citations a patent received that cannot be explained by the patent’s age and technology class – *i.e.*, the patent’s unique value, or “adjusted forward citations”.

According to the model, the ‘988 Patent had 23 adjusted forward citations, and the ‘039 Patent had 143 adjusted forward citations. Therefore, the ‘988 Patent had substantially fewer adjusted forward citations than the ‘039 Patent.

Figure 1 Estimation Results of the Main Model

Number of Observation	235,926					
R-Squared	0.30					
Adj R-Squared	0.30					
Root MSE	28.35					
Residual Deviation	2,247,765					
					95% Confidence Interval	
Parameters	Coefficient	Robust Std. Err.	t	P> t	Lower	Upper
a	32.15	0.22	145.38	0.00	31.72	32.58
m	-3.22	0.30	-10.81	0.00	-3.80	-2.64
b	128.40	8.04	15.96	0.00	112.64	144.17
c	0.43	0.01	59.91	0.00	0.42	0.45

### Sensitivity Analysis

The USPC was replaced by another classification system on January 1, 2013.<sup>4</sup> As such, in the main model, the best-matched International Patent Classification (“IPC”) subclasses were used as the criteria to query patents in USPC Classes 428 and 324 that issued post-2013.<sup>5</sup> This resulted in a small overlap of post-2013 patents that were determined to be in both classes; these patents were excluded from the regression in the main model.

As a sensitivity test, I also conducted a regression for each of the patent classes separately, thus utilizing all the patents queried, and used the class-specific model to calculate the adjusted forward citations.

For the patents in Class 428:  $\text{citation number}_i = a_1 / (1 + (b_1 * e^{-c_1 * \text{age}_i})) + \varepsilon_i$

<https://www.uspto.gov/sites/default/files/patents/resources/classification/overview.pdf>, at I-1 (accessed July 13, 2018).

<sup>4</sup> <http://ips.clarivate.com/m/pdfs/dwpicovkinds/CPC-2013.pdf>, at 1.

<sup>5</sup> <https://www.uspto.gov/web/patents/classification/uspc324/us324toipc8.htm> (accessed on July 16, 2018); <https://www.uspto.gov/web/patents/classification/uspc428/us428toipc8.htm> (accessed on July 10, 2018).

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For the patents in Class 324:  $citation\ number_j = a_2 / (1 + (b_2 * e^{-c_2 * age_j})) + \varepsilon_j$

Using this separately regressed model, I calculated the '988 patent to have 23 adjusted forward citations, and the '039 Patent to have 143. The results are essentially the same as those from the main model.

Figure 2 Estimation Results of the Separate Model (Class 324)

Number of Observation	86,251					
R-Squared	0.34					
Adj R-Squared	0.34					
Root MSE	23.40					
Residual Deviation	788,641					
					95% Confidence Interval	
		Robust Std.				
Parameters	Coefficient	Err.	t	P> t	Lower	Upper
a	28.53	0.26	109.61	0.00	28.02	29.04
b	105.71	8.66	12.21	0.00	88.74	122.67
c	0.43	0.01	43.47	0.00	0.41	0.45

Figure 3 Estimation Results of the Separate Model (Class 428)

Number of Observation	155,415					
R-Squared	0.29					
Adj R-Squared	0.29					
Root MSE	30.28					
Residual Deviation	1,501,127					
					95% Confidence Interval	
		Robust Std.				
Parameters	Coefficient	Err.	t	P> t	Lower	Upper
a	32.38	0.24	137.05	0.00	31.92	32.85
b	137.95	11.65	11.85	0.00	115.13	160.78
c	0.43	0.01	45.1	0.00	0.41	0.45

In addition, I also tested the main model with two additional variations of the citation numbers. The first excluded forward citations by non-U.S. patents, as they may be foreign versions of the U.S. patents that made the same forward citations. The second excluded "self-citations", which are defined as citations made by patents with the same assignee as the cited patent.

Both sensitivity tests yielded the same conclusion as the main model: the '988 patent has substantially fewer adjusted forward citations than the '039 patent. Counting only citations from U.S. patents, I calculated the '988 patent to have 21 adjusted forward citations, and the '039 Patent to have 138.

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Excluding “self-citations”, I calculated the ‘988 patent to have 24 adjusted forward citations, and the ‘039 Patent to have 144.<sup>6</sup>

Figure 4 Estimation Results of the Main Model (excluding non-U.S. citations)

Number of Observation	235,926					
R-Squared	0.29					
Adj R-Squared	0.29					
Root MSE	24.82					
Residual Deviation	2,184,915					
					95% Confidence Interval	
		Robust Std.				
Parameters	Coefficient	Err.	t	P> t	Lower	Upper
a	26.92	0.19	145.26	0.00	26.56	27.28
m	-2.45	0.26	-9.41	0.00	-2.96	-1.94
b	110.60	6.37	17.36	0.00	98.11	123.08
c	0.44	0.01	61.09	0.00	0.43	0.46

Figure 5 Estimation Results of the Main Model (excluding “self-citations”)

Number of Observation	235,926					
R-Squared	0.30					
Adj R-Squared	0.30					
Root MSE	27.69					
Residual Deviation	2,236,578					
					95% Confidence Interval	
		Robust Std.				
Parameters	Coefficient	Err.	t	P> t	Lower	Upper
a	31.51	0.22	144.49	0.00	31.08	31.93
m	-3.44	0.29	-11.77	0.00	-4.01	-2.86
b	160.42	11.43	14.03	0.00	138.01	182.83
c	0.44	0.01	56.68	0.00	0.43	0.46

<sup>6</sup> Neither of the two patents-of-interest had any “self-citations”. Some of the other patents in the two classes had “self-citations”. Therefore, the model predicts a slightly lower citation count when excluding these “self-citations”, resulting in slightly higher adjusted citation numbers for the two patents-of-interest.

TAB 18

**AGREEMENTS, ALLOCATIONS, AND VALUATIONS**  
**'988 PATENT AND SIMILAR TECHNOLOGIES**  
**INFLATION ADJUSTMENT**

	LMS Valuation	Syndia-Seagate License	Grunberg Patent	Allocation from Samsung	LMS Settlement with Acacia	Censtor-Seagate License	Censtor-Hitachi License	White-IBM License	LMS-TDK Settlement
[1] Effective Date	3/1/2014	12/27/2001	7/24/1997	3/2/2011	6/28/2013	3/7/2002	12/19/1994	10/20/2000	3/30/2017
[2] Nominal Amount	\$0.5	\$0.7	\$1.2			\$2.0 - \$4.0	\$5.0	\$6.5	\$5.1 - \$10.2
Inflation Adjusted Amount									
[3] 1994									
[4] 1995							\$5.0		
[5] 1996							\$5.3		
[6] 1997							\$5.6		
[7] 1998			\$1.2				\$5.9		
[8] 1999			\$1.3				\$6.1		
[9] 2000			\$1.4				\$6.4		
[10] 2001			\$1.4				\$6.8	\$6.6	
[11] 2002		\$0.7	\$1.5			\$2.0 - \$4.0	\$7.0	\$6.8	
[12] 2003		\$0.7	\$1.5			\$2.0 - \$4.1	\$7.1	\$6.9	
[13] 2004		\$0.7	\$1.5			\$2.0 - \$4.1	\$7.2	\$6.9	
[14] 2005		\$0.7	\$1.5			\$2.1 - \$4.2	\$7.3	\$7.0	
[15] 2006		\$0.8	\$1.6			\$2.2 - \$4.3	\$7.5	\$7.3	
[16] 2006 Q4 Hypothetical Negotiation	\$0.4	\$0.8	\$1.6	\$2.8	\$3.8	\$2.2 - \$4.5	\$7.8	\$7.6	\$4.7 - \$9.5

Notes & Sources:

Amounts adjusted for inflation using 3-Month Treasury Bill rate from <https://fred.stlouisfed.org/series/WTB3MS#0> (accessed July 16, 2018); Tab 12 and Tab 14.

Nominal Amount from Tab 12.

Values in millions. Values indicate inflation adjusted amount as of first quarter of each year.

CONFIDENTIAL ATTORNEY EYES ONLY INFORMATION

(also contains Third Party designated Outside Counsel's Eyes Only Information)

## TAB 19

**PREJUDGMENT INTEREST  
BASED ON THREE MONTH TREASURY BILL SECONDARY MARKET RATE  
CUMULATIVE INTEREST FACTOR**

Year	Quarter	Annualized Rate	Quarterly Rate	Cumulative Interest Factor	Lump-Sum Payment	Interest for Lump-Sum Payment	Lump-Sum Payment Including Interest
[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
2006	4	-	-	-	\$2.8 - \$7.8	\$0.2 - \$0.7	\$3.1 - \$8.5
2007	1	4.98%	1.24%	1.088	-	-	-
2007	2	4.74%	1.18%	1.074	-	-	-
2007	3	4.32%	1.08%	1.062	-	-	-
2007	4	3.41%	0.85%	1.050	-	-	-
2008	1	2.09%	0.52%	1.041	-	-	-
2008	2	1.62%	0.40%	1.036	-	-	-
2008	3	1.53%	0.38%	1.032	-	-	-
2008	4	0.33%	0.08%	1.028	-	-	-
2009	1	0.20%	0.05%	1.027	-	-	-
2009	2	0.17%	0.04%	1.027	-	-	-
2009	3	0.16%	0.04%	1.026	-	-	-
2009	4	0.06%	0.02%	1.026	-	-	-
2010	1	0.10%	0.03%	1.025	-	-	-
2010	2	0.15%	0.04%	1.025	-	-	-
2010	3	0.15%	0.04%	1.025	-	-	-
2010	4	0.14%	0.04%	1.024	-	-	-
2011	1	0.13%	0.03%	1.024	-	-	-
2011	2	0.05%	0.01%	1.024	-	-	-
2011	3	0.02%	0.01%	1.024	-	-	-
2011	4	0.02%	0.00%	1.024	-	-	-
2012	1	0.07%	0.02%	1.024	-	-	-
2012	2	0.09%	0.02%	1.023	-	-	-
2012	3	0.10%	0.03%	1.023	-	-	-
2012	4	0.09%	0.02%	1.023	-	-	-
2013	1	0.09%	0.02%	1.023	-	-	-
2013	2	0.05%	0.01%	1.022	-	-	-
2013	3	0.03%	0.01%	1.022	-	-	-
2013	4	0.06%	0.02%	1.022	-	-	-
2014	1	0.05%	0.01%	1.022	-	-	-
2014	2	0.03%	0.01%	1.022	-	-	-
2014	3	0.03%	0.01%	1.022	-	-	-
2014	4	0.02%	0.01%	1.022	-	-	-
2015	1	0.02%	0.01%	1.022	-	-	-
2015	2	0.02%	0.00%	1.022	-	-	-
2015	3	0.04%	0.01%	1.022	-	-	-
2015	4	0.11%	0.03%	1.021	-	-	-
2016	1	0.29%	0.07%	1.021	-	-	-
2016	2	0.26%	0.06%	1.020	-	-	-

## TAB 19

**PREJUDGMENT INTEREST  
BASED ON THREE MONTH TREASURY BILL SECONDARY MARKET RATE  
CUMULATIVE INTEREST FACTOR**

Year	Quarter	Annualized Rate	Quarterly Rate	Cumulative Interest Factor	Lump-Sum Payment	Interest for Lump-Sum Payment	Lump-Sum Payment Including Interest
[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
2016	3	0.30%	0.07%	1.020	-	-	-
2016	4	0.43%	0.11%	1.019	-	-	-
2017	1	0.60%	0.15%	1.018	-	-	-
2017	2	0.89%	0.22%	1.016	-	-	-
2017	3	1.04%	0.26%	1.014	-	-	-
2017	4	1.21%	0.30%	1.012	-	-	-
2018	1	1.56%	0.39%	1.009	-	-	-
2018	2	1.84%	0.46%	1.005	-	-	-

Notes & Sources:

Interest accrues from beginning of Q1 2007 through the end of Q2 2018.

[C] Amounts adjusted for inflation using 3-Month Treasury Bill rate from <https://fred.stlouisfed.org/series/WTB3MS#0> (accessed July 16, 2018).

[D] = [C] / 4.

[E] For 2018 Q2,  $(1 + [D]_t)$ . For all other periods,  $(1 + [D]_t) * [E]_{t+1}$ .

[F] From Tab 18. Amount as of end of Q4 2006

[G] = [H] - [F].

[H] = [E] \* [F].